BASE LISTING DOCUMENT DATED 23 MARCH 2020

If you are in any doubt about any of the contents of this document, you should obtain independent professional advice.

Non-collateralised Structured Products Base Listing Document relating to Structured Products to be issued by

UBS

UBS AG

(incorporated with limited liability in Switzerland)

acting through its London Branch

Sponsor

UBS Securities Asia Limited

This document, for which we accept full responsibility, includes particulars given in compliance with the Rules Governing the Listing of Securities on The Stock Exchange of Hong Kong Limited (the "**Listing Rules**") for the purpose of giving information with regard to us and our standard warrants ("**Warrants**"), callable bull/bear contracts ("**CBBCs**") and other structured products (together, "**Structured Products**") to be listed on the Stock Exchange from time to time. This document may be updated and/or amended from time to time by way of addenda.

We, having made all reasonable enquiries, confirm that to the best of our knowledge and belief the information contained in this document is accurate and complete in all material respects and not misleading or deceptive, and there are no other matters the omission of which would make any statement herein or this document misleading.

The Structured Products involve derivatives. Do not invest in them unless you fully understand and are willing to assume the risks associated with them.

Investors are warned that the price of the Structured Products may fall in value as rapidly as it may rise and holders may sustain a total loss of their investment. Prospective purchasers should therefore ensure that they understand the nature of the Structured Products and carefully study the risk factors set out in this document and, where necessary, seek professional advice, before they invest in the Structured Products.

The Structured Products are complex products. You should exercise caution in relation to them. The Structured Products constitute our general unsecured contractual obligations and of no other person and will rank equally among themselves and with all our other unsecured obligations (save for those obligations preferred by law) upon liquidation. If you purchase the Structured Products, you are relying upon our creditworthiness, and have no rights under the Structured Products against (a) the company which has issued the underlying securities; (b) the trustee or the manager of the underlying unit trust; or (c) the index compiler of any underlying index. If we become insolvent or default on our obligations under the Structured Products, you may not be able to recover all or even part of the amount due under the Structured Products (if any).

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What is this document about?

This document is for information purposes only and does not constitute an offer, an advertisement or invitation to the public to subscribe for or to acquire any Structured Products.

What documents should you read before investing in the Structured Products?

A launch announcement and supplemental listing document will be issued before the issue date of each series of Structured Products, which will include detailed commercial terms of the relevant series. You must read this document (including any addendum to this document to be issued from time to time) together with such launch announcement and supplemental listing document (including any addendum to such launch announcement and supplemental listing document to be issued from time to time) (together, the "**Listing Documents**") before investing in any Structured Product. You should carefully study the risk factors set out in the Listing Documents. You should also consider your financial position and investment objectives before deciding to invest in the Structured Products. We cannot give you investment advice. You must decide whether the Structured Products meet your investment needs before investing in the Structured Products.

Is there any guarantee or collateral for the Structured Products?

No. Our obligations under the Structured Products are neither guaranteed by any third party, nor collateralised with any of our assets or other collaterals. When you purchase our Structured Products, you are relying on our creditworthiness only, and of no other person. If we become insolvent or default on our obligations under the Structured Products, you can only claim as our unsecured creditor. In such event, you may not be able to recover all or even part of the amount due under the Structured Products (if any).

What are our credit ratings?

Our long term debt ratings are:

Rating agency	*Rating as of 20 March 2020*
Moody's Deutschland GmbH ("**Moody's**")	Aa3 (stable outlook)
S&P Global Ratings Europe Limited ("**S&P**")	A+ (stable outlook)

Our credit ratings disclosed above are only an assessment by the rating agencies of our overall capacity to pay our long term debts.

Aa3 is among the top two major credit rating categories and is the fourth highest investment-grade ranking of the ten investment-grade ratings (including 1, 2 and 3 sub-grades) assigned by Moody's.

A+ is among the top three major credit rating categories and is the fifth highest investment-grade ranking of the ten investment-grade ratings (including + or - sub-grades) assigned by S&P.

Please refer to the brief guide in Appendix 6 to this Base Listing Document for more information about credit ratings.

Rating agencies usually receive a fee from the issuers that they rate.

When evaluating our creditworthiness, you should not solely rely on our credit ratings because:

- a credit rating is not a recommendation to buy, sell or hold the Structured Products;
- ratings of companies may involve difficult-to-quantify factors such as market competition, the success or failure of new products and markets and managerial competence;
- a high credit rating is not necessarily indicative of low risk. Our credit ratings as of the date immediately preceding the date of this document are for reference only. Any downgrading of our credit ratings could result in a reduction in the value of the Structured Products;
- a credit rating is not an indication of the liquidity or volatility of the Structured Products; and
- a credit rating may be downgraded if our credit quality declines.

The Structured Products are not rated.

Our credit ratings are subject to change or withdrawal at any time within each rating agency's sole discretion. You should conduct your own research using publicly available sources to obtain the latest information with respect to our credit ratings from time to time.

Are we regulated by the Hong Kong Monetary Authority referred to in Rule 15A.13(2) or the Securities and Futures Commission referred to in Rule 15A.13(3)?

We are a licensed bank regulated by the Hong Kong Monetary Authority. We are also authorised and regulated by the Financial Market Supervisory Authority in Switzerland, and authorised by the Prudential Regulation Authority and subject to regulation by the Financial Conduct Authority and limited regulation by the Prudential Regulation Authority in the United Kingdom.

Are we subject to any litigation?

Save as disclosed in this document, we and our subsidiaries are not aware of any litigation or claims of material importance pending or threatened against us or them.

Authorisation for the issue of the Structured Products

The issue of the Structured Products was authorised by our board of directors on 19 September 2001.

Has our financial position changed since last financial year-end?

There has been no material adverse change in our financial or trading position since 31 December 2019.

Do you need to pay any trading fees and levies?

The Stock Exchange currently charges a trading fee of 0.005 per cent. and the Securities and Futures Commission currently charges a transaction levy of 0.0027 per cent. for each transaction effected on the Stock Exchange payable by each of the seller and the buyer and calculated on the value of the consideration for the Structured Products. The levy for the investor compensation fund is currently suspended.

Do you need to pay any tax?

Taxation in Hong Kong

No tax is payable in Hong Kong by way of withholding or otherwise in respect of any capital gains arising on the sale of the Structured Products, except that Hong Kong profits tax may be chargeable on any such gains, which is considered as trading gain, in the case of certain persons carrying on a trade, profession or business in Hong Kong.

You do not need to pay any stamp duty in respect of purely cash settled Structured Products.

Taxation in Switzerland

Under present Swiss law, if you are a non-resident of Switzerland and have not engaged in trade or business through a permanent establishment within Switzerland during the taxable year, you will not be subject to any Swiss Federal, Cantonal or Municipal income or other tax on gains realised during the year on the sale or redemption of the Structured Products.

There is no tax liability in Switzerland in connection with the issue of the Structured Products. However, Structured Products subscribed, transferred or redeemed through a bank or other dealer resident in Switzerland or Liechtenstein may be subject to Swiss securities transfer tax.

Taxation in United States of America

FATCA Withholding Tax

Pursuant to sections 1471 to 1474 of the U.S. Internal Revenue Code of 1986, as amended, commonly known as FATCA, a "**foreign financial institution**" (as defined by FATCA) may be required to withhold on (i) certain payments of U.S. source income and (ii) "foreign passthru payments" (a term which is not yet defined) paid to or in respect of persons that fail to meet certain certification, reporting or related requirements. A number of jurisdictions (including Switzerland) have entered into, or have agreed in substance to, intergovernmental agreements ("**IGAs**") with the United States to implement FATCA, which modify the way in which FATCA applies in their jurisdictions. Under the provisions of the IGAs as currently in effect, a foreign financial institution in an IGA jurisdiction would generally not be required to withhold under FATCA or an IGA from payments that it makes. Certain aspects of the application of the FATCA provisions and IGAs to instruments such as Structured Products, including whether withholding would ever be required pursuant to FATCA or an IGA with respect to payments on instruments such as Structured Products, are uncertain and may be subject to change. Even if withholding would be required pursuant to FATCA or an IGA with respect to payments on instruments such as Structured Products, such withholding would not apply to foreign passthru payments prior to the date that is two years after the publication of the final regulations defining "foreign passthru payment" in the U.S. Federal Register and, provided that Structured Products are properly treated as debt for U.S. federal income tax purposes, Structured Products issued on or prior to the date that is six months after the date on which final regulations defining foreign passthru payments are filed with the U.S. Federal Register generally would be grandfathered for purposes of FATCA withholding on foreign passthru payments unless materially modified after such date or classified as equity for U.S. federal income tax purposes. However, if additional Structured Products that are not distinguishable from previously issued Structured Products are issued after the expiration of the grandfathering period and are subject to withholding under FATCA, then withholding agents may treat all Structured Products, including the Structured Products offered prior to the expiration of the grandfathering period, as subject to withholding under FATCA. Holders should consult their own tax advisors regarding how these rules may apply to their investment in the Structured Products. In the event any withholding would be required pursuant to FATCA or an IGA with respect to payments on the Structured Products, neither UBS nor any other person will be required under the terms of the Structured Products to pay additional amounts as a result of the withholding.

The U.S. federal income tax discussion set forth above is included for general information only and may not be applicable depending upon an investor's particular situation. Prospective investors should consult their own tax advisers with respect to the tax consequences to them of the ownership and disposition of the Structured Products and the underlying stock, including the tax consequences under state, local, non-U.S. and other tax laws and the possible effects of changes in U.S. federal or other tax laws.

The above information is of a general nature only and is not intended to be a comprehensive description of all potential relevant tax considerations. We do not provide any tax advice for the Structured Products. Tax treatment depends on the individual circumstances of each client and clients must therefore seek their own tax advice from a reputable service provider. Prior to entering into a transaction you should consult with your own legal, regulatory, tax, financial and accounting advisors to the extent you consider it necessary, and make your own investment, hedging and trading decisions (including decisions regarding the suitability of this transaction) based upon your own judgment and advice from those advisors you consider necessary.

Placing, sale and grey market dealings

No offers, sales, re-sales, transfers or deliveries of any Structured Products, or distribution of any offering material relating to the Structured Products may be made in or from any jurisdiction except in circumstances which will result in compliance with any applicable laws or regulations and which will not impose any obligation on us. See the section "Placing and Sale" for further information.

Following the launch of a series of Structured Products, we may place all or part of that series with our related party.

The Structured Products may be sold to investors in the grey market in the period between the launch date and the listing date. We will report any dealings in Structured Products by us and/or any of our subsidiaries or associated companies in the grey market to the Stock Exchange by the listing date and such report will be released on the website of HKEX.

Where can you inspect the relevant documents?

The following documents are available for inspection during usual business hours on any weekday (Saturdays, Sundays and holidays excepted) at the offices of UBS Securities Asia Limited:

(a) the Annual Report 2019 of UBS Group AG and UBS AG ("**Annual Report 2019**");

(b) consent letter of our auditors, Ernst & Young Ltd ("**Auditors**");

(c) this document and any addendum to this document;

(d) the launch announcement and supplemental listing document as long as the relevant series of Structured Products is listed on the Stock Exchange; and

(e) the instrument executed by us by way of deed poll on 10 April 2006 which constitutes the Structured Products.

Requests for photocopies of the above documents will be subject to a reasonable fee which reflects the cost of making such copies.

The Listing Documents are also available on the website of the HKEX at *www.hkexnews.hk* and our website at *http://warrants.ubs.com/en*.

各上市文件亦可於香港交易所披露易網站 *www.hkexnews.hk* 以及我們的網站 *http://warrants.ubs.com/ch* 瀏覽。

Have the Auditors consented to the inclusion of their report to the Listing Documents?

Our Auditors have given and have not withdrawn their written consent to the inclusion of their report dated 27 February 2020 and/or the references to their name in this document, in the form and context in which they are included. Their report was not prepared exclusively for incorporation into this document. The Auditors do not own any of our shares or shares in our subsidiaries, nor do they have the right (whether legally enforceable or not) to subscribe for or to nominate persons to subscribe for our securities or securities of any of our subsidiaries.

Authorised representatives

Bernard Wu and Dougal McAdam, both of 52nd Floor, Two International Finance Centre, 8 Finance Street, Central, Hong Kong, are our authorised representatives and are authorised to accept services on our behalf in Hong Kong.

How can you get further information about UBS AG or the Structured Products?

You may visit *www.ubs.com* to obtain further information about us and *http://warrants.ubs.com/en* to obtain further information about the Structured Products.

Governing law of the Structured Products

All contractual documentation for the Structured Products will be governed by, and construed in accordance with, the laws of Hong Kong.

The Listing Documents are not the sole basis for making an investment decision

The Listing Documents do not take into account your investment objectives, financial situation or particular needs. Nothing in the Listing Documents should be construed as a recommendation by us or our affiliates to invest in the Structured Products or the underlying asset of the Structured Products.

No person has been authorised to give any information or to make any representations other than those contained in this document in connection with the Structured Products, and, if given or made, such information or representations must not be relied upon as having been authorised by us.

HKEX, the Stock Exchange and HKSCC have made no assessment of, nor taken any responsibility for, our financial soundness or the merits of investing in any Structured Products, nor have they verified the accuracy or the truthfulness of statements made or opinions expressed in this document.

This document has not been reviewed by the Securities and Futures Commission. You are advised to exercise caution in relation to the offer of the Structured Products.

Capitalised terms

Unless otherwise specified, capitalised terms used in this document have the meanings set out in the terms and conditions of the relevant series of Structured Products set out in Appendix 1 and Appendix 2 (together, the "**Conditions**").

General

No action has been or will be taken by us that would permit a public offering of any series of Structured Products or possession or distribution of any offering material in relation to any Structured Products in any jurisdiction (other than Hong Kong) where action for the purpose is required.

United States of America

Each series of Structured Products has not been, and will not be, registered under the United States Securities Act of 1933, as amended (the "**Securities Act**") or the securities laws of any state or other jurisdiction of the United States. Subject to certain exceptions, Structured Products or interests therein, may not at any time be offered, sold, resold, transferred or delivered, directly or indirectly, in the United States or to, or for the account or benefit of, any U.S. person or to others for offering, sale or resale in the United States or to any such U.S. person. Offers, sales and transfers of Structured Products, or interests therein, in the United States or to U.S. persons would constitute a violation of United States securities laws unless made in compliance with the registration requirements of the Securities Act or pursuant to an exemption therefrom. No person will offer, sell, re-sell, transfer or deliver any Structured Products or interests therein within the United States or to U.S. persons, except as permitted by the base placing agreement between us and the Sponsor, acting as manager. As used herein, "**United States**" means the United States of America (including the States and the District of Columbia), its territories, its possessions and other areas subject to its jurisdiction; and "**U.S. person**" means any national or resident of the United States, including any corporation, partnership or other entity created or organised in or under the laws of the United States or of any political subdivision thereof, any estate or trust the income of which is subject to United States income taxation regardless of its source, and any other U.S. person as such term is defined in Regulation S under the Securities Act.

In addition, until 40 days after the commencement of the offering, an offer, sale, re-sale, transfer or delivery of Structured Products within the United States by a dealer that is not participating in the offering may violate the registration requirements of the Securities Act.

European Economic Area and the United Kingdom

Each dealer represents and agrees, and each further dealer appointed in respect of the Structured Products will be required to represent and agree, that it has not offered, sold or otherwise made available and will not offer, sell, or otherwise make available any Structured Products which are the subject of the offering as contemplated by this Base Listing Document to any retail investor in the European Economic Area or in the United Kingdom. For the purposes of this provision:

(a) the expression "**retail investor**" means a person who is one (or more) of the following:

    (i) a retail client as defined in point (11) of Article 4(1) of Directive 2014/65/EU (as amended, "**MiFID II**"); or

    (ii) a customer within the meaning of Directive 2016/97/EU (as amended, the Insurance Distribution Directive), where that customer would not qualify as a professional client as defined in point (10) of Article 4(1) of MiFID II; or

    (iii) not a qualified investor as defined in Regulation (EU) 2017/1129 (as amended and superseded, the "**Prospectus Regulation**", the Prospectus Directive); and

(b) the expression "**offer**" includes the communication in any form and by any means of sufficient information on the terms of the offer and the Structured Products to be offered so as to enable an investor to decide to purchase or subscribe the Structured Products.

In respect of the United Kingdom, each dealer has further represented and agreed that:

(a) in respect to Structured Products having a maturity of less than one year: (i) it is a person whose ordinary activities involve it in acquiring, holding, managing or disposing of investments (as principal or agent) for the purposes of its business; and (ii) it has not offered or sold and will not offer or sell any Structured Products other than to persons whose ordinary activities involve them in acquiring, holding, managing or disposing of investments (as principal or agent) for the purposes of their businesses or who it is reasonable to expect will acquire, hold, manage or dispose of investments (as principal or agent) for the purposes of their businesses where the issue of the Structured Products would otherwise constitute a contravention of Section 19 of the Financial Services and Markets Act, as amended (the "**FSMA**") by us;

(b) it has only communicated or caused to be communicated and will only communicate or cause to be communicated an invitation or inducement to engage in investment activity (within the meaning of section 21 of the FSMA) received by it in connection with the issue or sale of the Structured Products in circumstances in which section 21(1) of the FSMA does not apply to us; and

(c) it has complied and will comply with all applicable provisions of the FSMA with respect to anything done by it in relation to any Structured Products in, from or otherwise involving the United Kingdom.

Switzerland

This document does not constitute an offer and does not constitute a prospectus within the meaning of the laws of Switzerland. The Structured Products may only be offered, sold or otherwise made available to (i) professional clients as defined in article 4 para. 3 and article 5 of the Federal Financial Services Act, "**FinSA**") or (ii), if a key information document within the meaning of article 58 FinSA is available, in accordance with the exemptions as set out in article 36 FinSA.

OVERVIEW OF WARRANTS

What is a Warrant?

A Warrant is a type of derivative warrants.

A derivative warrant linked to a share, a unit, an index or other asset (each an "**Underlying Asset**") is an instrument which gives the holder a right to "buy" or "sell" the Underlying Asset at, or derives its value by reference to, a pre-set price or level called the Exercise Price/Strike Level on the Expiry Date. It usually costs a fraction of the value of the Underlying Asset.

A derivative warrant may provide leveraged return to you (but conversely, it could also magnify your losses).

How and when can you get back your investment?

Our Warrants are European style warrants. That means they can only be exercised on the Expiry Date. A warrant will, upon exercise on the Expiry Date, entitle the holder to a cash amount called the "**Cash Settlement Amount**" (if positive) according to the Conditions of that warrant.

You will receive the Cash Settlement Amount less any Exercise Expenses upon settlement at expiry. If the Cash Settlement Amount is equal to or less than the Exercise Expenses, no amount is payable to you upon expiry.

How do our warrants work?

Ordinary warrants

The potential payoff of an ordinary warrant is calculated by us by reference to the difference between:

(a) for a warrant linked to a security, the Exercise Price and the Average Price; and

(b) for a warrant linked to an index, the Strike Level and the Closing Level.

Call warrants

A call warrant is suitable for an investor holding a bullish view of the price or level of the Underlying Asset during the term of the warrant.

A call warrant will be exercised if the Average Price/Closing Level is greater than the Exercise Price/Strike Level (as the case may be). The more the Average Price/Closing Level exceeds the Exercise Price/Strike Level (as the case may be), the higher the payoff upon expiry. If the Average Price/Closing Level is at or below the Exercise Price/Strike Level (as the case may be), an investor in the call warrant will lose all of his investment.

Put warrants

A put warrant is suitable for an investor holding a bearish view of the price or level of the Underlying Asset during the term of the warrant.

A put warrant will be exercised if the Average Price/Closing Level is below the Exercise Price/Strike Level (as the case may be). The more the Average Price/Closing Level is below the Exercise Price/Strike Level (as the case may be), the higher the payoff upon expiry. If the Exercise Price/Strike Level is at or below the Average Price/Closing Level (as the case may be), an investor in the put warrant will lose all of his investment.

Other types of warrants

The launch announcement and supplemental listing document applicable to other types of warrants will specify the type of such warrants and whether such warrants are exotic warrants.

The Conditions applicable to each type of our warrants are set out in Parts A to C of Appendix 1 (as may be supplemented by any addendum or the relevant launch announcement and supplemental listing document).

What are the factors determining the price of a derivative warrant?

The price of a derivative warrant generally depends on the prevailing price or level of the Underlying Asset. However, throughout the term of a derivative warrant, its price will be influenced by a number of factors, including:

(a) the Exercise Price or Strike Level;

(b) the value and volatility of the price or level of the Underlying Asset (being a measure of the fluctuation in the price or level of the Underlying Asset over time);

(c) the time remaining to expiry: generally, the longer the remaining life of a derivative warrant, the greater its value;

(d) the interim interest rates and expected dividend payments or other distributions on the Underlying Asset or on any components comprising the underlying index;

(e) the liquidity of the Underlying Asset;

(f) the supply and demand for the derivative warrants;

(g) our related transaction costs; and

(h) our creditworthiness.

What is your maximum loss?

Your maximum loss in warrants will be your entire investment amount plus any transaction costs.

How can you get information about our warrants after issue?

You may visit the website of HKEX at *http://www.hkex.com.hk/products/securities/derivative-warrants?sc_lang=en* or our website at *http://warrants.ubs.com/home/html/warrants_e.html* to obtain information on our warrants or any notice given by us or the Stock Exchange in relation to our warrants.

OVERVIEW OF CBBCS

What are CBBCs?

CBBCs are a type of Structured Products that track the performance of an Underlying Asset. CBBCs can be issued on different types of Underlying Assets as prescribed by the Stock Exchange from time to time, including:

(a) shares listed on the Stock Exchange;

(b) Hang Seng Index, Hang Seng China Enterprises Index and Hang Seng China H-Financials Index;

(c) unit trusts listed on the Stock Exchange; and/or

(d) overseas shares, indices, currencies or commodities (such as oil, gold and platinum).

A list of eligible Underlying Assets for CBBCs is available on the website of HKEX at *https://www.hkex.com.hk/Products/Securities/Callable-Bull-Bear-Contracts/CBBC-Eligible-Underlying-Assets/Eligible-Single-Hong-Kong-Stocks-for-CBBC-Issuance-in-Current-Quarter?sc_lang=en*

CBBCs are issued either as bull CBBCs or bear CBBCs, allowing you to take either bullish or bearish positions on the Underlying Asset. Bull CBBCs are designed for investors who have an optimistic view on the Underlying Asset. Bear CBBCs are designed for investors who have a pessimistic view on the Underlying Asset.

Your maximum potential loss in a series of CBBCs is limited to the purchase price, which is generally a fraction of the value of the Underlying Asset, for the CBBCs plus the cost involved in your purchase.

CBBCs have a mandatory call feature (the "**Mandatory Call Event**") and, subject to the limited circumstances set out in the relevant Conditions in which a Mandatory Call Event may be reversed, we must terminate our CBBCs upon the occurrence of a Mandatory Call Event. See "What are the mandatory call features of CBBCs?" below.

There are 2 categories of CBBCs, namely:

(a) Category R CBBCs; and

(b) Category N CBBCs.

Your entitlement following the occurrence of a Mandatory Call Event will depend on the category of the CBBCs.

If no Mandatory Call Event occurs, the CBBCs will be exercised automatically on the Expiry Date by payment of a Cash Settlement Amount (if any) on the Settlement Date. The Cash Settlement Amount (if any) payable at expiry represents the difference between the Closing Price/Closing Level of the Underlying Asset on the Valuation Date and the Strike Price/Strike Level.

The Conditions applicable to CBBCs are set out in Parts A to C of Appendix 2 (as may be supplemented by any addendum or the relevant launch announcement and supplemental listing document).

What are the mandatory call features of CBBCs?

Mandatory Call Event

Subject to the limited circumstances set out in the relevant Conditions in which a Mandatory Call Event may be reversed, we must terminate the CBBCs if a Mandatory Call Event occurs. A Mandatory Call Event occurs if the Spot Price/Spot Level of the Underlying Asset is:

(a) at or below the Call Price/Call Level (in the case of a bull CBBC); or

(b) at or above the Call Price/Call Level (in the case of a bear CBBC),

at any time during the Observation Period.

The Observation Period starts from and including the Observation Commencement Date of the relevant CBBCs and ends on and including the Trading Day immediately preceding the Expiry Date.

Subject to the limited circumstances set out in the relevant Conditions in which a Mandatory Call Event may be reversed and such modification and amendment as may be prescribed by the Stock Exchange from time to time:

(a) all trades in the CBBCs concluded or recorded in the Stock Exchange's system after the time of the occurrence of a Mandatory Call Event; and

(b) where the Mandatory Call Event occurs during a pre-opening session or closing auction session (if applicable), all auction trades in the CBBCs concluded in such session,

will be invalid and will be cancelled, and will not be recognised by us or the Stock Exchange.

The time at which a Mandatory Call Event occurs will be determined by reference to:

(a) in respect of CBBCs over single equities or CBBCs over single unit trusts, the Stock Exchange's automatic order matching and execution system time at which the Spot Price is at or below the Call Price (for a series of bull CBBCs) or is at or above the Call Price (for a series of bear CBBCs); or

(b) in respect of CBBCs over index, the time the relevant Spot Level is published by the Index Compiler at which the Spot Level is at or below the Call Level (for a series of bull CBBCs) or is at or above the Call Level (for a series of bear CBBCs),

subject to the rules and requirements as prescribed by the Stock Exchange from time to time.

Category R CBBCs vs. Category N CBBCs

The launch announcement and supplemental listing document for the relevant series of CBBCs will specify whether the CBBCs are Category R CBBCs or Category N CBBCs.

"**Category N CBBCs**" refer to CBBCs for which the Call Price/Call Level is equal to their Strike Price/Strike Level. In respect of a series of Category N CBBCs, you will not receive any cash payment following the occurrence of a Mandatory Call Event.

"**Category R CBBCs**" refer to CBBCs for which the Call Price/Call Level is different from their Strike Price/Strike Level. In respect of a series of Category R CBBCs, you may receive a cash payment called the Residual Value upon the occurrence of a Mandatory Call Event. The amount of the Residual Value payable (if any) is calculated by reference to:

(a) in respect of a bull CBBC, the difference between the Minimum Trade Price/Minimum Index Level of the Underlying Asset and the Strike Price/Strike Level; and

(b) in respect of a bear CBBC, the difference between the Strike Price/Strike Level and the Maximum Trade Price/Maximum Index Level of the Underlying Asset.

You must read the relevant Conditions and the relevant launch announcement and supplemental listing document to obtain further information on the calculation formula of the Residual Value applicable to Category R CBBCs.

You may lose all of your investment in a particular series of CBBCs if:

(a) in the case of a series of bull CBBCs, the Minimum Trade Price/Minimum Index Level of the Underlying Asset is equal to or less than the Strike Price/Strike Level; or

(b) in the case of a series of bear CBBCs, the Maximum Trade Price/Maximum Index Level of the Underlying Asset is equal to or greater than the Strike Price/Strike Level.

How is the funding cost calculated?

The issue price of a CBBC represents the difference between the initial reference spot price or level of the Underlying Asset as at the launch date of the CBBC and the Strike Price/Strike Level, plus the applicable funding cost.

The initial funding cost applicable to each series of CBBCs will be specified in the relevant launch announcement and supplemental listing document for the relevant series and will fluctuate throughout the life of the CBBCs as the funding rate changes from time to time. The funding rate is a rate determined by us based on one or more of the following factors, including but not limited to the Strike Price/Strike Level, the prevailing interest rate, the expected life of the CBBCs, expected notional dividends or distributions in respect of the Underlying Asset and the margin financing provided by us.

Further details about the funding cost applicable to a series of CBBCs will be described in the relevant launch announcement and supplemental listing document.

Do you own the Underlying Asset?

CBBCs convey no interest in the Underlying Asset. We may choose not to hold the Underlying Asset or any derivatives contracts linked to the Underlying Asset. There is no restriction through the issue of the CBBCs on the ability of us and/or our affiliates to sell, pledge or otherwise convey all right, title and interest in any Underlying Asset or any derivatives products linked to the Underlying Asset.

What are the factors determining the price of a CBBC?

Although the price of a CBBC tends to mirror the movement in the value of the Underlying Asset in dollar value (on the assumption of an entitlement ratio of one CBBC to one Underlying Asset), movement in the price of the CBBC may not always correspond with the movement in value of the Underlying Asset.

However, throughout the term of a CBBC, its price will be influenced by a number of factors, including:

(a) the Strike Price/Strike Level and the Call Price/Call Level;

(b) the likelihood of the occurrence of a Mandatory Call Event;

(c) for Category R CBBCs only, the probable range of the Residual Value (if any) payable upon the occurrence of a Mandatory Call Event;

(d) the time remaining to expiry;

(e) the interim interest rates and expected dividend payments or other distributions on the Underlying Asset or on any components comprising the underlying index;

(f) the liquidity of the Underlying Asset;

(g) the supply and demand for the CBBCs;

(h) the probable range of the Cash Settlement Amounts;

(i) the depth of the market and liquidity of the Underlying Asset or of the future contracts relating to the underlying index;

(j) our related transaction costs; and

(k) our creditworthiness.

What is your maximum loss?

Your maximum loss in CBBCs will be your entire investment amount plus any transaction costs.

How can you get information about our CBBCs after issue?

You may visit the website of HKEX at *http://www.hkex.com.hk/Products/Securities/Callable-Bull-Bear-Contracts?sc_lang=en* or our website at *http://warrants.ubs.com/home/html/cbbc_e.html* to obtain information on our CBBCs or any notice given by us or the Stock Exchange in relation to our CBBCs.

1. Overview

UBS AG with its subsidiaries (together, "**UBS AG consolidated**", or "**UBS AG Group**"; together with UBS Group AG, which is the holding company of UBS AG, and its subsidiaries, "**UBS Group**", "**Group**", "**UBS**" or "**UBS Group AG consolidated**") provides financial advice and solutions to private, institutional and corporate clients worldwide, as well as private clients in Switzerland. The operational structure of the Group is comprised of the Corporate Center and four business divisions: Global Wealth Management, Personal & Corporate Banking, Asset Management and the Investment Bank.

2. Information about UBS AG

2.1. Corporate Information

The legal and commercial name of the company is UBS AG.

The company was incorporated under the name SBC AG on 28 February 1978 for an unlimited duration and entered in the Commercial Register of Canton Basel-City on that day. On 8 December 1997, the company changed its name to UBS AG. The company in its present form was created on 29 June 1998 by the merger of Union Bank of Switzerland (founded 1862) and Swiss Bank Corporation (founded 1872). UBS AG is entered in the Commercial Registers of Canton Zurich and Canton Basel-City. The registration number is CHE-101.329.561.

UBS AG is incorporated and domiciled in Switzerland and operates under the Swiss Code of Obligations as an *Aktiengesellschaft*, a corporation limited by shares. UBS AG's Legal Entity Identifier (LEI) code is BFM8T61CT2L1QCEMIK 50.

According to article 2 of the articles of association of UBS AG dated 26 April 2018, the purpose of UBS AG is the operation of a bank. Its scope of operations extends to all types of banking, financial, advisory, trading and service activities in Switzerland and abroad. UBS AG may establish branches and representative offices as well as banks, finance companies and other enterprises of any kind in Switzerland and abroad, hold equity interests in these companies, and conduct their management. UBS AG is authorized to acquire, mortgage and sell real estate and building rights in Switzerland and abroad. UBS AG may borrow and invest money on the capital markets. UBS AG is part of the group of companies controlled by the group parent company UBS Group AG. It may promote the interests of the group parent company or other group companies. It may provide loans, guarantees and other kinds of financing and security for group companies.

The addresses and telephone numbers of UBS AG's two registered offices and principal places of business are: Bahnhofstrasse 45, CH-8001 Zurich, Switzerland, telephone +41 44 234 1111; and Aeschenvorstadt 1, CH-4051 Basel, Switzerland, telephone +41 61 288 5050.

2.2 UBS's borrowing and funding structure and financing of UBS's activities

For information on UBS's expected financing of its business activities, please refer to "Balance sheet, liquidity and funding management" in the "Treasury management" section of the UBS Group AG and UBS AG Annual Report 2019 published on 28 February 2020 ("**Annual Report 2019**")

3. Organizational Structure of UBS AG

UBS AG is a Swiss bank and the parent company of the UBS AG Group. It is 100% owned by UBS Group AG, which is the holding company of the UBS Group. UBS operates as a group with four business divisions and a Corporate Center.

In 2014, UBS began adapting its legal entity structure to improve the resolvability of the Group in response to too big to fail requirements in Switzerland and recovery and resolution regulation in other countries in which the Group operates. In December 2014, UBS Group AG became the holding company of the Group.

In 2015, UBS AG transferred its personal & corporate banking and wealth management businesses booked in Switzerland to the newly established UBS Switzerland AG, a banking subsidiary of UBS AG in Switzerland. In 2016, UBS Americas Holding LLC was designated as the intermediate holding company for UBS's subsidiaries in the United States ("**US**") and UBS merged its wealth management subsidiaries in various European countries into UBS Europe SE, UBS's German-headquartered European subsidiary. Additionally, UBS transferred the majority of Asset Management's operating subsidiaries to UBS Asset Management AG. Effective 1 April 2019, the portion of the Asset Management business in Switzerland conducted by UBS AG was transferred from UBS AG to its indirect subsidiary, UBS Asset Management Switzerland AG.

UBS Business Solutions AG, a wholly owned subsidiary of UBS Group AG, was established in 2015 and acts as the Group service company. In 2017, UBS's shared services functions in Switzerland and the United Kingdom ("**UK**") were transferred from UBS AG to UBS Business Solutions AG. UBS also completed the transfer of shared services functions in the US to its US service company, UBS Business Solutions US LLC, a wholly owned subsidiary of UBS Americas Holding LLC.

In March 2019, UBS Limited, UBS's UK headquartered subsidiary, was merged into UBS Europe SE prior to the UK's then scheduled departure from the European Union ("**EU**"). Former clients and other counterparties of UBS Limited who can be serviced by UBS AG's London Branch were migrated to UBS AG's London Branch prior to the merger.

UBS continues to consider further changes to the Group's legal structure in response to regulatory requirements and other external developments. Such changes may include further consolidation of operating subsidiaries in the EU and adjustments to the booking entity or location of products and services.

UBS Group AG's interests in subsidiaries and other entities as of 31 December 2019, including interests in significant subsidiaries, are discussed in "*Note 31 Interests in subsidiaries and other entities*" to the UBS Group AG's consolidated financial statements included in the Annual Report 2019.

UBS AG's interests in subsidiaries and other entities as of 31 December 2019, including interests in significant subsidiaries, are discussed in "*Note 31 Interests in subsidiaries and other entities*" to the UBS AG's consolidated financial statements included in the Annual Report 2019.

4. Board of Directors ("BoD")

The BoD consists of at least five and no more than twelve members. All the members of the BoD are elected individually by the Annual General Meeting of Shareholders ("**AGM**") for a term of office of one year, which expires after the completion of the next AGM. Shareholders also elect the Chairman upon proposal of the BoD.

The BoD meets as often as business requires, and at least six times a year.

4.1 Members of the Board of Directors

Member	Title	Term of office	Current principal activities outside UBS AG
Axel A. Weber	Chairman	2020	Chairman of the Board of Directors of UBS Group AG; board member of the Swiss Bankers Association; Trustees Board member of Avenir Suisse; board member of the Swiss Finance Council; Chairman of the board of the Institute of International Finance; member of the European Financial Services Round Table; member of the European Banking Group; member of the International Advisory Councils of the China Banking and Insurance Regulatory Commission and the China Securities Regulatory Commission; member of the International Advisory Panel, Monetary Authority of Singapore; member of the Group of Thirty, Washington, D.C.; Chairman of the Board of Trustees of DIW Berlin; Advisory Board member of the Department of Economics, University of Zurich; member of the Trilateral Commission.
David Sidwell	Vice Chairman	2020	Vice Chairman and Senior Independent Director of the Board of Directors of UBS Group AG; Senior Advisor at Oliver Wyman, New York; board member of the board of Chubb Limited; board member of GAVI Alliance; member of the Board of Village Care, New York.
Jeremy Anderson	Member	2020	Member of the Board of Directors of UBS Group AG; board member of Prudential plc; trustee of the UK's Productivity Leadership Group; trustee of Kingham Hill Trust; trustee of St. Helen Bishopsgate.
William C. Dudley	Member	2020	Member of the Board of Directors of UBS Group AG; senior research scholar at the Griswold Center for Economic Policy Studies at Princeton University; member of the Board of Treliant LLC; member of the Group of Thirty; member of the Council on Foreign Relations; member of the Bretton Woods Committee's Advisory Council.

Member	Title	Term of office	Current principal activities outside UBS AG
Reto Francioni	Member	2020	Member of the Board of Directors of UBS Group AG; professor at the University of Basel; board member of Coca-Cola HBC AG (Senior Independent Non-Executive Director, chair of the nomination committee); Chairman of the board of Swiss International Air Lines AG; board member of MedTech Innovation Partners AG; executive director and member of my TAMAR GmBH.
Fred Hu	Member	2020	Member of the Board of Directors of UBS Group AG; non-executive chairman of the board of Yum China Holdings (chair of the nomination and governance committee); board member of Industrial and Commercial Bank of China; board member of Hong Kong Exchanges and Clearing Ltd.; founder and chairman of Primavera Capital Group; board member of China Asset Management; board member of Minsheng Financial Leasing Co.; trustee of the China Medical Board; Governor of the Chinese International School in Hong Kong; co-chairman of the Nature Conservancy Asia Pacific Council; director and member of the Executive Committee of China Venture Capital and Private Equity Association Ltd.; Global Advisory Board member of the Council on Foreign Relations.

Member	Title	Term of office	Current principal activities outside UBS AG
Julie G. Richardson	Member	2020	Member of the Board of Directors of UBS Group AG; member of the board of Yext (chair of the audit committee); member of the board of Vereit, Inc. (chair of the compensation committee); member of the board of Datalog (chair of the audit committee); member of the board of The Hartford Financial Services Group, Inc. (resignation effective 1 April 2020).
Isabelle Romy	Member	2020	Member of the Board of Directors of UBS Group AG; partner and board member at Froriep Legal AG; professor at the University of Fribourg and at the Federal Institute of Technology, Lausanne; chair of the board of Central Real Estate Holding AG; chair of the board of Central Real Estate Basel AG; Vice Chairman of the Sanction Commission of the SIX Swiss Exchange; member of the Fundraising Committee of the Swiss National Committee for UNICEF; Supervisory Board member of the CAS program Financial Regulation of the University of Bern and University of Geneva.
Robert W. Scully	Member	2020	Member of the Board of Directors of UBS Group AG; member of the board of Chubb Limited (chair of the audit committee); member of the board of Zoetis, Inc.; member of the board of KKR & Co. Inc.; member of the board of Teach For All.
Beatrice Weder di Mauro	Member	2020	Member of the Board of Directors of UBS Group AG; professor of international economics at the Graduate Institute Geneva (IHEID); president of the Centre for Economic Policy Research in London; Research Professor and Distinguished Fellow at INSEAD in Singapore; Supervisory Board member of Robert Bosch GmbH; board member of Bombardier Inc.; member of the Foundation Board of the International Center for Monetary and Banking Studies (ICMB).
Dieter Wemmer	Member	2020	Member of the Board of Directors of UBS Group AG; board member of Ørsted A/S (chair of the audit and risk committee); member of the Berlin Center of Corporate Governance.
Jeanette Wong	Member	2020	Member of the Board of Directors of UBS Group AG; board member of Essilor International and EssilorLuxottica; board member of Jurong Town Corporation; board member of PSA International; board member of FFMC Holdings Pte. Ltd.; board member of Fullerton Fund Management Company Ltd.; member of the NUS Business School Management Advisory Board; member of the Global Advisory Board, Asia, University of Chicago Booth School of Business; member of the Securities Industry Council.

Not all of the risk factors described below will be applicable to a particular series of the Structured Products. Please consider all risks carefully prior to investing in any Structured Products and consult your professional independent financial adviser and legal, accounting, tax and other advisers with respect to any investment in the Structured Products. Please read the following section together with the risk factors set out in the relevant launch announcement and supplemental listing document.

General risks relating to us

Non-collateralised Structured Products

The Structured Products are not secured on any of our assets or any collateral.

Each series of Structured Products constitutes our general unsecured contractual obligations and of no other person and will rank equally with our other unsecured contractual obligations and unsecured and unsubordinated debt. At any given time, the number of our Structured Products outstanding may be substantial.

Our creditworthiness

If you invest in our Structured Products, you are relying on our creditworthiness and of no other person. If we become insolvent or default on our obligations under the Structured Products, you can only claim as our unsecured creditor regardless of the performance of the Underlying Asset and you may not be able to recover all or even part of the amount due under the Structured Products (if any). You have no rights under the terms of the Structured Products against:

(a) any company which issues the underlying shares;

(b) the trustee or the manager of the underlying trust; or

(c) any index compiler or any company which has issued any constituent securities of the underlying index.

We do not guarantee the repayment of your investment in any Structured Product.

Any downgrading of our credit rating by rating agencies such as Moody's or S&P, could result in a reduction in the value of the Structured Products.

Swiss resolution and recovery regime

Under the Swiss Banking Act, FINMA is able to exercise broad statutory powers with respect to Swiss banks and Swiss parent companies of financial groups, such as UBS AG, UBS Group AG and UBS Switzerland AG, if there is justified concern that the entity is overindebted, has serious liquidity problems or, after the expiration of any relevant deadline, no longer fulfils capital adequacy requirements. Such powers include ordering protective measures, instituting restructuring proceedings (and exercising any Swiss resolution powers in connection therewith), and instituting liquidation proceedings, all of which may have a material adverse effect on shareholders and creditors or may prevent UBS Group AG, UBS AG or UBS Switzerland AG from paying dividends or making payments on debt obligations.

Protective measures may include, but are not limited to, certain measures that could require or result in a moratorium on, or the deferment of, payments. UBS would have limited ability to challenge any such protective measures, and creditors would have no right under Swiss law or in Swiss courts to reject them, seek their suspension, or challenge their imposition, including measures that require or result in the deferment of payments.

If restructuring proceedings are opened with respect to UBS Group AG, UBS AG or UBS Switzerland AG, the resolution powers that FINMA may exercise include the power to (i) transfer all or some of the assets, debt and other liabilities, and contracts of the entity subject to proceedings to another entity, (ii) stay for a maximum of two business days the termination of, or the exercise of rights to terminate, netting rights, rights to enforce or dispose of certain types of collateral or rights to transfer claims, liabilities or certain collateral, under contracts to which the entity subject to proceedings is a party, and / or (iii) partially or fully write down the equity capital and, if such equity capital is fully written down, convert into equity or write down the capital and other debt instruments of the entity subject to proceedings. Shareholders and creditors would have no right to reject, or to seek the suspension of, any restructuring plan pursuant to which such resolution powers are exercised. They would have only limited rights to challenge any decision to exercise resolution powers or to have that decision reviewed by a judicial or administrative process or otherwise.

Upon full or partial write-down of the equity and of the debt of the entity subject to restructuring proceedings, the relevant shareholders and creditors would receive no payment in respect of the equity and debt that is written down, the write-down would be permanent, and the investors would not, at such time or at any time thereafter, receive any shares or other participation rights, or be entitled to any write-up or any other compensation in the event of a potential recovery of the debtor. If FINMA orders the conversion of debt of the entity subject to restructuring proceedings into equity, the securities received by the investors may be worth significantly less than the original debt and may have a significantly different risk profile, and such conversion would also dilute the ownership of existing shareholders. In addition, creditors receiving equity would be effectively subordinated to all creditors in the event of a subsequent winding up, liquidation or dissolution of the entity subject to restructuring proceedings, which would increase the risk that investors would lose all or some of their investment.

FINMA has broad powers and significant discretion in the exercise of its powers in connection with restructuring proceedings. Furthermore, certain categories of debt obligations, such as certain types of deposits, are subject to preferential treatment. As a result, holders of obligations of an entity subject to a Swiss restructuring proceeding may have their obligations written down or converted into equity even though obligations ranking on par with or junior to such obligations are not written down or converted.

Moreover, FINMA has expressed its preference for a "single-point-of-entry" resolution strategy for global systemically important financial groups, led by the bank's home supervisory and resolution authorities and focused on the top-level group company. This would mean that, if UBS AG or one of UBS Group AG's other subsidiaries faces substantial losses, FINMA could open restructuring proceedings with respect to UBS Group AG only and order a bail-in of its liabilities if there is a justified concern that in the near future such losses could impact UBS Group AG. In that case, it is possible that the obligations of UBS AG or any other subsidiary of UBS Group AG would remain unaffected and outstanding, while the equity capital and the capital and other debt instruments of UBS Group AG would be written down and / or converted into equity of UBS Group AG in order to recapitalise UBS AG or such other subsidiary.

In any event, the exercise of any resolution power by the relevant resolution authorities in respect of UBS could materially adversely affect the value of the Structured Product, and you may not be able to recover all or even part of the amount due under the Structured Product.

Hong Kong Financial Institutions (Resolution) Ordinance

The Financial Institutions (Resolution) Ordinance (Cap. 628, the Laws of Hong Kong) (the "**FIRO**") was enacted by the Legislative Council of Hong Kong in June 2016. The FIRO (except Part 8, section 192 and Division 10 of Part 15 thereof) came into operation on 7 July 2017.

The FIRO provides a regime for the orderly resolution of financial institutions with a view to avoiding or mitigating the risks otherwise posed by their non-viability to the stability and effective working of the financial system of Hong Kong, including the continued performance of critical financial functions. The FIRO seeks to provide the relevant resolution authorities with a range of powers to bring about timely and orderly resolution in order to stabilise and secure continuity for a failing authorised institution in Hong Kong. In particular, it is envisaged that subject to certain safeguards, the relevant resolution authority would be provided with powers to affect contractual and property rights as well as payments (including in respect of any priority of payment) that creditors would receive in resolution, including but not limited to powers to write off, or convert into equity, all or a part of the liabilities of the failing financial institution.

As an authorised institution regulated by the Hong Kong Monetary Authority, we are subject to and bound by the FIRO. The exercise of any resolution power by the relevant resolution authority under the FIRO in respect of us may have a material adverse effect on the value of the Structured Products, and as a result, you may not be able to recover all or any amount due under the Structured Products.

Repurchase of our Structured Products

We, our subsidiaries and affiliates (the "**Group**") may repurchase the Structured Products from time to time in the private market or otherwise at a negotiated price or the prevailing market price at our discretion. You should not make any assumption as to the number of Structured Products in issue for any particular series at any time.

No deposit liability or debt obligation

We are obliged to deliver to you the Cash Settlement Amount under the Conditions of each series of the Structured Products upon expiry. We do not intend (expressly, implicitly or otherwise) to create a deposit liability or a debt obligation of any kind by the issue of any Structured Product.

Conflicts of interest

The Group is a diversified financial institution with relationships in countries around the world. The Group engages in a wide range of commercial and investment banking, brokerage, funds management, hedging transactions and investment and other activities for our own account or the account of others. In addition, the Group, in connection with our other business activities, may possess or acquire material information about the Underlying Assets or may issue or update research reports on the Underlying Assets. Such activities, information and/or research reports may involve or otherwise affect the Underlying Assets in a manner that may cause consequences adverse to you or otherwise create conflicts of interests in connection with the issue of Structured Products by us. Such actions and conflicts may include, without limitation, the purchase and sale of securities, financial advisory relationships and exercise of creditor rights. The Group:

(a) has no obligation to disclose such information about the Underlying Assets or such activities. The Group and our officers and directors may engage in any such activities without regard to the issue of Structured Products by us or the effect that such activities may directly or indirectly have on any Structured Product;

(b) may from time to time engage in transactions involving the Underlying Assets for our proprietary accounts and/or for accounts under our management and/or to hedge against the market risk associated with issuing the Structured Products. Such transactions may have a positive or negative effect on the price/level of the Underlying Assets and consequently upon the value of the relevant series of Structured Products;

(c) may from time to time act in other capacities with regard to the Structured Products, such as in an agency capacity and/or as the liquidity provider;

(d) may issue other derivative instruments in respect of the Underlying Assets and the introduction of such competing products into the market place may affect the value of the relevant series of Structured Products; and

(e) may also act as underwriter in connection with future offerings of shares, units or other securities or may act as financial adviser to the issuer, or sponsor, as the case may be, of any such share, unit or other security or in a commercial banking capacity for the issuer of any share, units or other security or the trustee or the manager of the trust. Such activities could present certain conflicts of interest and may affect the value of the Structured Products.

Our operating environment and strategy

Certain risks, including those as set out in Appendix 5, may impact our ability to execute our strategy and directly affect our business activities, financial condition, results of operations and prospects. As a broad-based international financial services firm, we are inherently exposed to risks that become apparent only with the benefit of hindsight, risks of which we are not presently aware or which we currently do not consider to be material could also materially affect our business activities, financial condition, results of operations and prospects.

The sequence in which the risk factors are set out in Appendix 5 is not indicative of their likelihood of occurrence or the potential magnitude of their financial consequences.

Our operating results, financial condition and ability to pay obligations in the future

Our ability to pay its obligations in the future may be affected by the level of funding, dividends and other distributions, if any, received from UBS Switzerland AG and any other subsidiaries currently existing or established by us in the future. The ability of such subsidiaries to make loans or distributions (directly or indirectly) to us may be restricted as a result of several factors, including restrictions in financing agreements, the requirements of applicable laws and regulatory, fiscal or other restrictions. Our subsidiaries, including UBS Switzerland AG, UBS Limited and the US IHC (when designated) are subject to laws and regulations that restrict dividend payments, authorize regulatory bodies to block or reduce the flow of funds from those subsidiaries to us, or limit or prohibit transactions with affiliates. Restrictions and regulatory actions of this kind could impede access to funds that we may need to make payments.

In addition, our right to participate in a distribution of assets upon a subsidiary's liquidation or reorganization is subject to all prior claims of the subsidiary's creditors.

Furthermore, we may guarantee some of the payment obligations of certain of our subsidiaries from time to time. Additionally, in connection with the transfer of the Retail & Corporate (now Personal & Corporate Banking) and Wealth Management business booked in Switzerland from us to UBS Switzerland AG in June 2015, under the Swiss Merger Act, UBS AG is jointly liable for obligations existing on the asset transfer date, 14 June 2015, that were transferred to UBS Switzerland AG. These guarantees may require us to provide substantial funds or assets to subsidiaries or their creditors or counterparties at a time when we are in need of liquidity to fund our own obligations.

General risks relating to Structured Products

You may lose all your investment in the Structured Products

Structured Products involve a high degree of risk, and are subject to a number of risks which may include interest, foreign exchange, time value, market and/or political risks. Structured Products may expire worthless.

Options, warrants and asset linked instruments are priced primarily on the basis of the price/level of the Underlying Asset, the volatility of the Underlying Asset's price/level and the time remaining to expiry of the Structured Product.

The price of Structured Products generally may fall in value as rapidly as they may rise and you should be prepared to sustain a significant or total loss of the purchase price of the Structured Products. Assuming all other factors are held constant, the more the underlying share price, unit price or index level of a Structured Product moves in a direction against you and the shorter its remaining term to expiration, the greater the risk that you will lose all or a significant part of your investment.

The Structured Products are only exercisable on their respective Expiry Dates and may not be exercised by you prior to the relevant Expiry Date. Accordingly, if on such Expiry Date the Cash Settlement Amount is zero or negative, you will lose the value of your investment.

The risk of losing all or any part of the purchase price of a Structured Product means that, in order to recover and realise a return on investment, you must generally anticipate correctly the direction, timing and magnitude of any change in the price/level of the Underlying Asset as may be specified in the relevant launch announcement and supplemental listing document.

Changes in the price/level of an Underlying Asset can be unpredictable, sudden and large and such changes may result in the price/level of the Underlying Asset moving in a direction which will negatively impact upon the return on your investment. You therefore risk losing your entire investment if the price/level of the relevant Underlying Asset does not move in the anticipated direction.

The value of the Structured Products may be disproportionate or opposite to movement in price/level of the Underlying Assets

An investment in Structured Products is not the same as owning the Underlying Assets or having a direct investment in the Underlying Asset. The market values of Structured Products are linked to the relevant Underlying Assets and will be influenced (positively or negatively) by it or them but any change may not be comparable and may be disproportionate. It is possible that while the price/level of the Underlying Assets is increasing, the value of the Structured Product is falling.

If you intend to purchase any series of Structured Products to hedge against the market risk associated with investing in the Underlying Asset specified in the relevant launch announcement and supplemental listing document, you should recognise the complexities of utilizing Structured Products in this manner. For example, the value of the Structured Products may not exactly correlate with the price/level of the Underlying Asset. Due to fluctuations in supply and demand for Structured Products, there is no assurance that their value will correlate with movements of the Underlying Asset. The Structured Products may not be a perfect hedge to the Underlying Asset or portfolio of which the Underlying Asset forms a part.

It may not be possible to liquidate the Structured Products at a level which directly reflects the price/level of the Underlying Asset or portfolio of which the Underlying Asset forms a part. Therefore, it is possible that you could suffer substantial losses in the Structured Products in addition to any losses suffered with respect to investments in or exposures to the Underlying Asset.

Possible illiquidity of secondary market

It is not possible to predict if and to what extent a secondary market may develop in any series of Structured Products and at what price such series of Structured Products will trade in the secondary market and whether such market will be liquid or illiquid. The fact that the Structured Products are listed does not necessarily lead to greater liquidity than if they were not listed.

If any series of Structured Products are not listed or traded on any exchange, pricing information for such series of Structured Products may be difficult to obtain and the liquidity of that series of Structured Products may be adversely affected.

The liquidity of any series of Structured Products may also be affected by restrictions on offers and sales of the Structured Products in some jurisdictions. Transactions in off-exchange Structured Products may be subject to greater risks than dealing in exchange-traded Structured Products. To the extent that any Structured Products of a series is closed out, the number of Structured Products outstanding in that series will decrease, which may result in a lessening of the liquidity of Structured Products. A lessening of the liquidity of the affected series of Structured Products may cause, in turn, an increase in the volatility associated with the price of such Structured Products.

While we have, or will appoint, a liquidity provider for the purposes of making a market for each series of Structured Products, there may be circumstances outside our control or the appointed liquidity provider's control where the appointed liquidity provider's ability to make a market in some or all series of Structured Products is limited, restricted, and/or without limitation, frustrated. In such circumstances we will use our best endeavours to appoint an alternative liquidity provider.

Interest rates

Investments in the Structured Products may involve interest rate risk with respect to the currency of denomination of the Underlying Assets and/or the Structured Products. A variety of factors influence interest rates such as macro economic, governmental, speculative and market sentiment factors. Such fluctuations may have an impact on the value of the Structured Products at any time prior to valuation of the Underlying Assets relating to the Structured Products.

Time decay

The settlement amount of certain series of Structured Products at any time prior to expiration may be less than the trading price of such Structured Products at that time. The difference between the trading price and the settlement amount will reflect, among other things, a "time value" of the Structured Products.

The "time value" of the Structured Products will depend upon, among others, the length of the period remaining to expiration and expectations concerning the range of possible future price/level of the Underlying Assets. The value of a Structured Product will decrease over time as the length of the period remaining to expiration becomes shorter. Therefore, the Structured Products should not be viewed as products for long term investments.

Exchange rate risk

There may be an exchange rate risk in the case of Structured Products where the Cash Settlement Amount will be converted from a foreign currency into Hong Kong dollars. Exchange rates between currencies are determined by forces of supply and demand in the foreign exchange markets. These forces are, in turn, affected by factors such as international balances of payments and other economic and financial conditions, government intervention in currency markets and currency trading speculation.

Fluctuations in foreign exchange rates, foreign political and economic developments and the imposition of exchange controls or other foreign governmental laws or restrictions applicable to such investments may affect the foreign currency market price and the exchange rate-adjusted equivalent price of the Structured Products. Fluctuations in the exchange rate of any one currency may be offset by fluctuations in the exchange rate of other relevant currencies. There can be no assurance that rates of exchange between any relevant currencies which are current rates at the date of issue of any Structured Products will be representative of the relevant rates of exchange used in computing the value of the relevant Structured Products at any time thereafter.

Where Structured Products are described as being "quantoed", the value of the Underlying Assets will be converted from one currency (the "**Original Currency**") into a new currency (the "**New Currency**") on the date and in the manner specified in, or implied by, the Conditions using a fixed exchange rate. The cost to us of maintaining such a fixing between the Original Currency and the New Currency will have an implication on the value of the Structured Products, which will vary during the term of the Structured Products. No assurance can be given as to whether or not, taking into account relative exchange rate and interest rate fluctuations between the Original Currency and the New Currency, a quanto feature in a Structured Product would at any time enhance the return on the Structured Product over a level of a similar Structured Product issued without such a quanto feature.

Taxes

You may be required to pay stamp duty or other taxes or other documentary charges. If you are in doubt as to your tax position, you should consult your own independent tax advisers. In addition, you should be aware that tax regulations and their application by the relevant taxation authorities change from time to time. Accordingly, it is not possible to predict the precise tax treatment which will apply at any given time. See "Do you need to pay any tax?" in the section headed "Important Information" on pages 4 to 5 for further information.

Modification to the Conditions

Under the Conditions, we may, without your consent, effect any modification of the terms and conditions of the Structured Products or the Instrument which, in our opinion, is:

(a) not materially prejudicial to the interest of the Structured Products holders generally (without considering your individual circumstances or the tax or other consequences of such modification in any particular jurisdiction);

(b) of a formal, minor or technical nature;

(c) made to correct a manifest error; or

(d) necessary in order to comply with mandatory provisions of the laws or regulations of Hong Kong.

Possible early termination for illegality or impracticability

If we determine in good faith and in a commercially reasonable manner that, for reasons beyond our control, the performance of our obligations under the Structured Products has become illegal or impracticable (or in the case of CBBCs only, it is no longer desirable or practical for us to maintain our hedging arrangement with respect to the CBBCs), we may terminate early such Structured Products. If we terminate early the Structured Products, we will, if and to the extent permitted by applicable law, pay an amount determined by us in good faith and in a commercially reasonable manner to be their fair market value notwithstanding the illegality or impracticability (or hedging disruption) less the cost to us of unwinding any related hedging arrangements, which may be substantially less than your initial investment and may be zero.

Risks relating to the Underlying Asset

You have no right to the Underlying Asset

Unless specifically indicated in the Conditions, you will not be entitled to:

(i) voting rights or rights to receive dividends or other distributions or any other rights that a holder of the Underlying Asset would normally be entitled to; or

(ii) voting rights or rights to receive dividends or other distributions or any other rights with respect to any company constituting any underlying index.

Valuation risk

An investment in Structured Products may involve valuation risk as regards the Underlying Assets to which the particular series of Structured Products relate. The price/level of the Underlying Asset may vary over time and may increase or decrease by reference to a variety of factors which may include corporate actions, macro economic factors, speculation and (where the Underlying Asset is an index) changes in the formula for or the method of calculating the index.

You must be experienced with dealing in these types of Structured Products and must understand the risks associated with dealing in such products. You should reach an investment decision only after careful consideration, with your advisers, of the suitability of any Structured Product in light of your particular financial circumstances, the information regarding the relevant Structured Product and the particular Underlying Asset to which the value of the relevant Structured Product relates.

Adjustment related risk

In the case of Structured Products relating to a single equity or a unit trust ("**Security**"), certain corporate events relating to the Security require or, as the case may be, permit us to make certain adjustments or amendments to the Conditions. You have limited anti-dilution protection under the Conditions of the Structured Products. We may, in our sole discretion adjust, among other things, the Entitlement, the Exercise Price (if applicable), the Call Price (if applicable), the Strike Price (if applicable) or any other terms (including without limitation the Closing Price of the Security) of any series of Structured Product for events such as rights issue, bonus issue, subdivision, consolidation, cash distribution or restructuring event. However, we are not required to make an adjustment for every event that may affect a Security, in which case the market price of the Structured Products and the return upon the expiry of the Structured Products may be affected.

In addition, if the Security ceases to be listed on the Stock Exchange during the term of the Structured Products, we may make adjustments and/or amendments to the rights attaching to the Structured Products pursuant to the Conditions of the Structured Products. Such adjustments and/or amendments will be conclusive and binding on you.

In the case of Structured Products which relate to an index, the level of the index may be published by the index compiler at a time when one or more shares comprising in the index are not trading. If this occurs on the Valuation Date but such occurrence does not constitute a Market Disruption Event under the Conditions then the value of such share(s) may not be included in the level of the index. In addition, certain events relating to the index (including a material change in the formula or the method of calculating the index or a failure to publish the index) permit us to determine the level of the index on the basis of the formula or method last in effect prior to such change in formula or method.

Suspension of trading

If the Underlying Assets are suspended from trading or dealing for whatever reason on the market on which they are listed or dealt in (including the Stock Exchange), trading in the relevant series of Structured Products will be suspended for a similar period. The value of the Structured Products will decrease over time as the length of the period remaining to expiration becomes shorter. In such circumstances, you should note that in the case of a prolonged suspension period, the market price of the Structured Products may be subject to a significant impact of time decay of such prolonged suspension period and may fluctuate significantly upon resumption of trading after the suspension period of the Structured Products. This may adversely affect your investment in the Structured Products.

Delay in settlement

Unless otherwise specified in the relevant Conditions, in the case of any expiry of Structured Products, there may be a time lag between the date on which the Structured Products expire, and the time the applicable settlement amount relating to such event is determined. Any such delay between the time of expiry and the determination of the settlement amount will be specified in the relevant Conditions.

However, such delay could be significantly longer, particularly in the case of a delay in the expiry of such Structured Products arising from our determination that a Market Disruption Event, Settlement Disruption Event or delisting of the underlying shares or units has occurred at any relevant time or that adjustments are required in accordance with the Conditions.

That applicable settlement amount may change significantly during any such period, and such movement or movements could decrease or modify the settlement amount of the Structured Products.

You should note that in the event of there being a Settlement Disruption Event or a Market Disruption Event, payment of the Cash Settlement Amount may be delayed as more fully described in the Conditions.

Risks relating to Structured Products over trusts

General risks

In the case of Structured Products which relate to the units of a trust:

(a) neither we nor any of our affiliates have the ability to control or predict the actions of the trustee or the manager of the relevant trust. Neither the trustee nor the manager of the relevant trust (i) is involved in the offer of any Structured Product in any way, or (ii) has any obligation to consider the interest of the holders of any Structured Product in taking any corporate actions that might affect the value of any Structured Product; and

(b) we have no role in the relevant trust. The manager of the relevant trust is responsible for making strategic, investment and other trading decisions with respect to the management of the relevant trust consistent with its investment objectives and in compliance with the investment restrictions as set out in the constitutive documents of the relevant trust. The manner in which the relevant trust is managed and the timing of actions may have a significant impact on the performance of the relevant trust. Hence, the market price of the relevant units is also subject to these risks.

Exchange traded funds

Where the Underlying Asset of Structured Products comprises the units of an exchange traded fund ("**ETF**"), you should note that:

(a) an ETF is exposed to the economic, political, currency, legal and other risks of a specific sector or market related to the underlying asset pool or index or market that the ETF is designed to track;

(b) there may be disparity between the performance of the ETF and the performance of the underlying asset pool or index or market that the ETF is designed to track as a result of, for example, failure of the tracking strategy, currency differences, fees and expenses; and

(c) where the underlying asset pool or index or market that the ETF tracks is subject to restricted access, the efficiency in the unit creation or redemption to keep the price of the ETF in line with its net asset value may be disrupted, causing the ETF to trade at a higher premium or discount to its net asset value. Hence, the market price of the Structured Products will also be indirectly subject to these risks.

Synthetic exchange traded funds

Additionally, where the Underlying Asset of Structured Products comprises the units of an ETF adopting a synthetic replication investment strategy to achieve its investment objectives by investing in financial derivative instruments linked to the performance of an underlying asset pool or index that the ETF is designed to track ("**Synthetic ETF**"), you should note that:

(a) investments in financial derivative instruments will expose the Synthetic ETF to the credit, potential contagion and concentration risks of the counterparties who issued such financial derivative instruments. As such counterparties are predominantly international financial institutions, the failure of any such counterparty may have a negative effect on other counterparties of the Synthetic ETF. Even if the Synthetic ETF has collateral to reduce the counterparty risk, there may still be a risk that the market value of the collateral has fallen substantially when the Synthetic ETF seeks to realise the collateral; and

(b) the Synthetic ETF may be exposed to higher liquidity risk if the Synthetic ETF invests in financial derivative instruments which do not have an active secondary market.

The above risks may have a significant impact on the performance of the relevant ETF or Synthetic ETF and hence the market price of Structured Products linked to such ETF or Synthetic ETF.

ETF investing through RQFII and/or China Connect

Where the Underlying Asset of Structured Products comprises the units of an ETF ("**China ETF**") issued and traded outside Mainland China with direct investment in the Mainland China's securities markets through the Renminbi Qualified Foreign Institutional Investor ("**RQFII**") regime and/or the Shanghai-Hong Kong Stock Connect and Shenzhen-Hong Kong Stock Connect (collectively, "**China Connect**"), you should note that, amongst others:

(a) the novelty and untested nature of China Connect make China ETFs riskier than traditional ETFs investing directly in more developed markets. The policy and rules for RQFII and China Connect prescribed by the Mainland China government are new and subject to change, and there may be uncertainty to their implementation. The uncertainty and change of the laws and regulations in Mainland China may adversely impact on the performance of the China ETFs and the trading price of the relevant units;

(b) a China ETF primarily invests in securities traded in the Mainland China's securities markets and is subject to concentration risk. Investment in the Mainland China's securities markets (which are inherently stock markets with restricted access) involves certain risks and special considerations as compared with investment in more developed economies or markets, such as greater political, tax, economic, foreign exchange, liquidity and regulatory risks. The operation of a China ETF may also be affected by interventions by the applicable government(s) and regulators in the financial markets; and

(c) investment by a China ETF in the Mainland China's securities markets under the RQFII regime is currently subject to its manager's RQFII quota allocated to such China ETF. In addition, trading of securities invested by the China ETF under China Connect will be subject to a daily quota which does not belong to such China ETF and is utilised on a first-come-first-serve basis. In the event that the RQFII quota allocated to such China ETF and/or the daily quota under China Connect are reached, the manager may need to suspend creation of further units of such China ETF, and therefore may affect the liquidity in unit trading of such China ETF. In such event, the trading price of a unit of such China ETF is likely to be at a significant premium to its net asset value, and may be highly volatile. Although the State Administration of Foreign Exchange has announced that the quota restrictions under the RQFII (and Qualified Foreign Institutional Investor) regimes will be removed, the detailed implementation rules and official effective date of the quota removal are not yet available.

The above risks may have a significant impact on the performance of the China ETF and the price of the Structured Products linked to such China ETF.

Please read the offering documents of the China ETF to understand its key features and risks.

ETF traded through dual counters model

Where the Underlying Asset of Structured Products comprises the units of an ETF which adopts the dual counters model for trading its units on the Stock Exchange in Renminbi ("**RMB**") and Hong Kong dollars ("**HKD**") separately, the novelty and relatively untested nature of the Stock Exchange's dual counters model may bring the following additional risks:

(a) the Structured Products may be linked to the HKD-traded units or the RMB-traded units. If the Underlying Asset of Structured Products is the HKD-traded units, movements in the trading prices of the RMB-traded units should not directly affect the price of the Structured Products. Similarly, if the Underlying Asset of Structured Products is the RMB-traded units, movements in the trading prices of the HKD-traded units should not directly affect the price of the Structured Products;

(b) if there is a suspension of inter-counter transfer of such units between the HKD counter and the RMB counter for any reason, such units will only be able to be traded in the relevant currency counter on the Stock Exchange, which may affect the demand and supply of such units and have an adverse effect on the price of the Structured Products; and

(c) the trading price on the Stock Exchange of the HKD-traded units and RMB-traded units may deviate significantly due to different factors, such as market liquidity, RMB conversion risk, supply and demand in each counter and the exchange rate between RMB and HKD. Changes in the trading price of the Underlying Asset of Structured Products in HKD or RMB (as the case may be) may adversely affect the price of the Structured Products.

*Real estate investment trust ("**REIT**")*

Where the Underlying Asset of Structured Products comprises the units of a REIT, you should note that the investment objective of a REIT is to invest in a real estate portfolio. Each REIT is exposed to risks relating to investments in real estate, including but not limited to (a) adverse changes in political or economic conditions; (b) changes in interest rates and the availability of debt or equity financing, which may result in an inability by the REIT to maintain or improve the real estate portfolio and finance future acquisitions; (c) changes in environmental, zoning and other governmental rules; (d) changes in market rents; (e) any required repair and maintenance of the portfolio properties; (f) breach of any property laws or regulations; (g) the relative illiquidity of real estate investment; (h) real estate taxes; (i) any hidden interests in the portfolio properties; (j) any increase in insurance premiums and (k) any uninsurable losses.

There may also be disparity between the market price of the units of a REIT and the net asset value per unit. This is because the market price of the units of a REIT also depends on many factors, including but not limited to (a) the market value and perceived prospects of the real estate portfolio; (b) changes in economic or market conditions; (c) changes in market valuations of similar companies; (d) changes in interest rates; (e) the perceived attractiveness of the units of the REIT against those of other equity securities; (f) the future size and liquidity of the market for the units and the REIT market generally; (g) any future changes to the regulatory system, including the tax system and (h) the ability of the REIT to implement its investment and growth strategies and to retain its key personnel.

The above risks may have a significant impact on the performance of the relevant units and the price of the Structured Products.

Risk relating to CBBCs

Correlation between the price of a CBBC and the price/level of the Underlying Asset

When the Underlying Asset of a CBBC is trading at a price/level close to its Call Price/Call Level, the price of that CBBC tends to be more volatile and any change in the value of that CBBC at such time may be incomparable and disproportionate to the change in the price/level of the Underlying Asset.

You may lose your entire investment when a Mandatory Call Event occurs

Unlike warrants, CBBCs has a mandatory call feature and trading in the CBBCs will be suspended when the Spot Level/Spot Price reaches the Call Level/Call Price (subject to the circumstances in which a Mandatory Call Event will be reversed as set out below). No investors can sell the CBBCs after the occurrence of a Mandatory Call Event. Even if the level/price of the Underlying Asset bounces back in the right direction, the CBBCs which have been terminated as a result of the Mandatory Call Event will not be revived and investors will not be able to profit from the bounce-back. Investors may receive a Residual Value after the occurrence of a Mandatory Call Event but such amount may be zero.

Mandatory Call Event is irrevocable except in limited circumstances

A Mandatory Call Event is irrevocable unless it is triggered as a result of any of the following events:

(a) system malfunction or other technical errors of HKEX (such as the setting up of wrong Call Price/Call Level and other parameters), and such event is reported by the Stock Exchange to us and we and the Stock Exchange mutually agree that such Mandatory Call Event is to be revoked; or

(b) manifest errors caused by the relevant third party price source where applicable (such as miscalculation of the index level by the relevant index compiler), and such event is reported by us to the Stock Exchange and we and the Stock Exchange mutually agree that such Mandatory Call Event is to be revoked,

in each case, such mutual agreement must be reached between the Stock Exchange and us as prescribed in the relevant procedures by the Stock Exchange from time to time. Upon revocation of the Mandatory Call Event, trading of the CBBCs will resume and any trade cancelled after such Mandatory Call Event will be reinstated.

Non-recognition of Post MCE Trades

The Stock Exchange and its recognised exchange controller, HKEX, shall not incur any liability (whether based on contract, tort (including, without limitation, negligence), or any other legal or equitable grounds and without regard to the circumstances giving rise to any purported claim except in the case of wilful misconduct on the part of the Stock Exchange and/or HKEX) for any direct, consequential, special, indirect, economic, punitive, exemplary or any other loss or damage suffered or incurred by us or any other party arising from or in connection with the Mandatory Call Event or the suspension of trading ("**Trading Suspension**") or the non-recognition of trades after a Mandatory Call Event ("**Non-Recognition of Post MCE Trades**"), including without limitation, any delay, failure, mistake or error in the Trading Suspension or Non-Recognition of Post MCE Trades.

We and our affiliates shall not have any responsibility towards you for any losses suffered as a result of the Trading Suspension and/or Non-Recognition of Post MCE Trades in connection with the occurrence of a Mandatory Call Event, notwithstanding that such Trading Suspension or Non-Recognition of Post MCE Trades may have occurred as a result of an error in the observation of the event.

Residual Value will not include residual funding cost

For Category R CBBCs, the Residual Value (if any) payable by us following the occurrence of a Mandatory Call Event will not include the residual funding cost for the CBBCs. You will not receive any residual funding cost back from us upon early termination of a Category R CBBC following the occurrence of a Mandatory Call Event.

Delay in announcements of a Mandatory Call Event

The Stock Exchange will notify the market as soon as practicable after the CBBC has been called. You must however be aware that there may be delay in the announcements of a Mandatory Call Event due to technical errors or system failures and other factors that are beyond our control or the control of the Stock Exchange.

Our hedging activities may adversely affect the price/level of the Underlying Asset

We and/or any of our affiliates may carry out activities that minimise our risks related to the CBBCs, including effecting transactions for our own account or for the account of our customers and hold long or short positions in the Underlying Asset whether for risk reduction purposes or otherwise. In addition, in connection with the offering of any CBBCs, we and/or any of our affiliates may enter into one or more hedging transactions with respect to the Underlying Asset. In connection with such hedging or market-making activities or with respect to proprietary or other trading activities by us and/or any of our affiliates, we and/or any of our affiliates may enter into transactions in the Underlying Asset which may affect the market price, liquidity or price/level of the Underlying Asset and/or the value of CBBCs and which could be deemed to be adverse to your interests. We and/or our affiliates are likely to modify our hedging positions throughout the life of the CBBCs whether by effecting transactions in the Underlying Asset or in derivatives linked to the Underlying Asset. Further, it is possible that the advisory services which we and/or our affiliates provide in the ordinary course of our business could lead to an adverse impact on the value of the Underlying Asset.

Unwinding of hedging arrangements

The trading and/or hedging activities of us or our affiliates related to CBBCs and/or other financial instruments issued by us from time to time may have an impact on the price/level of the Underlying Asset and may trigger a Mandatory Call Event. In particular, when the Underlying Asset is trading close to the Call Price/Call Level, our unwinding activities may cause a fall or rise (as the case may be) in the trading price/level of the Underlying Asset, leading to a Mandatory Call Event as a result of such unwinding activities.

In respect of Category N CBBCs, we or our affiliates may unwind any hedging transactions entered into by us in relation to the CBBCs at any time even if such unwinding activities may trigger a Mandatory Call Event.

In respect of Category R CBBCs, before the occurrence of a Mandatory Call Event, we or our affiliates may unwind our hedging transactions relating to the CBBCs in proportion to the amount of the CBBCs we repurchase from time to time. Upon the occurrence of a Mandatory Call Event, we or our affiliates may unwind any hedging transactions in relation to the CBBCs. Such unwinding activities after the occurrence of a Mandatory Call Event may affect the trading price/level of the Underlying Asset and consequently the Residual Value for the CBBCs.

Risk relating to the legal form of the Structured Products

Each series of Structured Products will be represented by a global certificate registered in the name of HKSCC Nominees Limited (or such other nominee company as may be used by HKSCC from time to time in relation to the provision of nominee services to persons admitted for the time being by HKSCC as a participant of CCASS).

Structured Products issued in global registered form and held on your behalf within a clearing system effectively means that the evidence of your title, as well as the efficiency of ultimate delivery of the Cash Settlement Amount, will be subject to the CCASS Rules. You should be aware of the following risks:

(a) you will not receive definitive certificates where the Structured Products remain in the name of HKSCC Nominees Limited for the entire life of the Structured Products;

(b) any register that is maintained by us or on our behalf, while available for inspection by you, will not be capable of registering any interests other than that of the legal title owner, in other words, it will record at all times that the Structured Products are being held by HKSCC Nominees Limited;

(c) you will have to rely solely upon your broker/custodians and the statements you receive from such party as evidence of your interest in the investment;

(d) notices or announcements will be published on the HKEX website and/or released by HKSCC to its participants via CCASS. You will need to check the HKEX website regularly and/or rely on your brokers/ custodians to obtain such notices/ announcements; and

(e) following the Expiry Date and the determination by us as to the Cash Settlement Amount, our obligations to you will be duly performed by payment of the Cash Settlement Amount in accordance with the Conditions to HKSCC Nominees Limited as the "holder" of the Structured Products. HKSCC or HKSCC Nominees Limited will then distribute the received Cash Settlement Amount to the respective CCASS participants in accordance with the CCASS Rules.

Fee arrangements with brokers and conflicts of interest of brokers

We may enter into fee arrangements with brokers and/or any of its affiliates with respect to the primary market in the Structured Products. You should note that any brokers with whom we have a fee arrangement does not, and cannot be expected to, deal exclusively in the Structured Products, therefore any broker and/or its subsidiaries or affiliates may from time to time engage in transactions involving the Underlying Assets and/or the structured products of other issuers over the same Underlying Assets to which the particular series of Structured Products may relate, or other underlying assets as the case may be, for their proprietary accounts and/or for the accounts or their clients. The fact that the same broker may deal simultaneously for different clients in competing products in the market place may affect the value of the Structured Products and present certain conflicts of interests.

Effect of the combination of risk factors unpredictable

Two or more risk factors may simultaneously have an effect on the value of a series of Structured Products such that the effect of any individual risk factor may not be predictable. No assurance can be given as to the effect any combination of risk factors may have on the value of a series of Structured Products.

APPENDIX 1 — TERMS AND CONDITIONS OF WARRANTS

The following pages set out the Conditions in respect of different types of Warrants.

PART A — TERMS AND CONDITIONS OF CASH SETTLED WARRANTS OVER SINGLE EQUITIES

These Conditions will, together with the supplemental provisions contained in the relevant Launch Announcement and Supplemental Listing Document, and subject to completion and amendment, be endorsed on the Global Certificate. The relevant Launch Announcement and Supplemental Listing Document in relation to the issue of any series of Warrants may specify other terms and conditions which shall, to the extent so specified or to the extent they are inconsistent with these Conditions, replace or modify these Conditions for the purpose of such series of Warrants.

1. Form, Status, Transfer, Title and Additional Costs and Expenses

(A) The Warrants (which expression shall, unless the context otherwise requires, include any further warrants issued pursuant to Condition 11) relating to the Shares of the Company are issued in registered form subject to and with the benefit of an instrument by way of deed poll (the "**Instrument**" as defined more fully in the relevant Launch Announcement and Supplemental Listing Document) executed by UBS AG (the "**Issuer**") acting through its London branch or any of its branches outside Switzerland as it may specify from time to time. The Warrantholders (as defined below) are entitled to the benefit of, are bound by, and are deemed to have notice of all the provisions of the Instrument. A copy of the Instrument is available for inspection at the offices of UBS Securities Asia Limited ("**Sponsor**") at 52nd Floor, Two International Finance Centre, 8 Finance Street, Central, Hong Kong.

The Warrants are represented by a global certificate ("**Global Certificate**") registered in the name of HKSCC Nominees Limited (or such other nominee company as may be used by Hong Kong Securities Clearing Company Limited ("**HKSCC**") from time to time in relation to the provision of nominee services to persons admitted for the time being by HKSCC as a participant of CCASS) (the "**Nominee**"). No definitive certificate will be issued. The Warrants can only be exercised by HKSCC or the Nominee.

(B) The settlement obligation of the Issuer in respect of the Warrants represents general unsecured contractual obligations of the Issuer and of no other person which rank, and will rank, equally among themselves and pari passu with all other present and future unsecured and unsubordinated contractual obligations of the Issuer, except for obligations accorded preference by mandatory provisions of applicable law.

Warrants represent general contractual obligations of the Issuer, and are not, nor is it the intention (expressed, implicit or otherwise) of the Issuer to create by the issue of Warrants deposit liabilities of the Issuer or a debt obligation of any kind.

(C) Transfers of Warrants may be effected only in Board Lots or integral multiples thereof in CCASS in accordance with the General Rules of CCASS and the CCASS Operational Procedures in effect from time to time (the "**CCASS Rules**").

(D) Each person who is for the time being shown in the register kept by the Issuer in Hong Kong as the holder shall be treated by the Issuer and the Sponsor as the absolute owner and holder of the Warrants. The expressions "**Warrantholder**" and "**Warrantholders**" shall be construed accordingly.

(E) Warrantholders are responsible for additional costs and expenses in connection with any exercise of the Warrants including the Exercise Expenses (as defined below) which amount shall, subject to Condition 2(B) and to the extent necessary, be payable to the Issuer and collected from the Warrantholders.

2. Warrant Rights and Exercise Expenses

(A) Every Board Lot entitles the Warrantholders, upon due exercise and upon compliance with these Conditions, in particular Condition 3, to payment of the Cash Settlement Amount (as defined below), if any.

(B) The Warrantholders will be required to pay a sum equal to all the expenses resulting from the exercise of such Warrants. To effect such payment an amount equivalent to the Exercise Expenses (defined below) shall be deducted from the Cash Settlement Amount in accordance with Condition 3(E).

(C) For the purposes of these Conditions:

"**Average Price**" means the arithmetic mean of the closing prices of one Share (as derived from the Daily Quotation Sheet of the Stock Exchange, subject to any adjustment to such closing prices as may be necessary to reflect any event as contemplated in Condition 5 such as capitalisation, rights issue, distribution or the like) in respect of each Valuation Date;

"**Board Lot**" has the meaning given to it in the relevant Launch Announcement and Supplemental Listing Document;

"**Business Day**" means a day (excluding Saturdays) on which the Stock Exchange is scheduled to open for dealings in Hong Kong and banks are open for business in Hong Kong;

"**Cash Settlement Amount**" means, for every Board Lot, an amount in the Settlement Currency calculated by the Issuer in accordance with the following formula:

(i) In the case of a series of call Warrants:

$$\text{Cash Settlement Amount per Board Lot} = \frac{\text{Entitlement x (Average Price - Exercise Price) x one Board Lot}}{\text{Number of Warrant(s) per Entitlement}}$$

(ii) In the case of a series of put Warrants:

$$\text{Cash Settlement Amount per Board Lot} = \frac{\text{Entitlement x (Exercise Price - Average Price) x one Board Lot}}{\text{Number of Warrant(s) per Entitlement}}$$

For the avoidance of doubt, if the Cash Settlement Amount is a negative figure, it shall be deemed to be zero;

"**CCASS**" means the Central Clearing and Settlement System;

"**CCASS Settlement Day**" has the meaning ascribed to the term "Settlement Day" in the CCASS Rules, subject to such modification and amendment prescribed by HKSCC from time to time;

"**Company**" means the company specified as such in the relevant Launch Announcement and Supplemental Listing Document;

"**Entitlement**" means the number specified as such in the relevant Launch Announcement and Supplemental Listing Document, subject to any adjustment in accordance with Condition 5;

"**Exercise Expenses**" means any charges or expenses including any taxes or duties which are incurred in respect of the exercise of a Board Lot of Warrants;

“**Exercise Price**” means the price specified as such in the relevant Launch Announcement and Supplemental Listing Document, subject to any adjustment in accordance with Condition 5;

“**Expiry Date**” means the date specified as such in the relevant Launch Announcement and Supplemental Listing Document;

“**HKEX**” means Hong Kong Exchanges and Clearing Limited;

“**Listing Date**” means the date specified as such in the relevant Launch Announcement and Supplemental Listing Document;

“**Market Disruption Event**” means:

(1) the occurrence or existence on any Valuation Date during the one-half hour period that ends at the close of trading of any suspension of or limitation imposed on trading (by reason of movements in price exceeding limits permitted by the Stock Exchange or otherwise) on the Stock Exchange in (a) the Shares; or (b) any options or futures contracts relating to the Shares if, in any such case, such suspension or limitation is, in the determination of the Issuer, material;

(2) the issuance of the tropical cyclone warning signal number 8 or above or the issuance of a “BLACK” rainstorm signal on any day which either (i) results in the Stock Exchange being closed for trading for the entire day; or (ii) results in the Stock Exchange being closed prior to its regular time for close of trading for the relevant day (for the avoidance of doubt, in the case when the Stock Exchange is scheduled to open for the morning trading session only, closed prior to its regular time for close of trading for the morning session), PROVIDED THAT there shall be no Market Disruption Event solely by reason of the Stock Exchange opening for trading later than its regular time for opening of trading on any day as a result of the tropical cyclone warning signal number 8 or above or the “BLACK” rainstorm signal having been issued; or

(3) a limitation or closure of the Stock Exchange due to any unforeseen circumstances;

“**Settlement Currency**” means the currency specified as such in the relevant Launch Announcement and Supplemental Listing Document;

“**Settlement Date**” means the third CCASS Settlement Day after the later of: (i) the Expiry Date; and (ii) the day on which the Average Price is determined in accordance with the Conditions;

“**Share**” means the share specified as such in the relevant Launch Announcement and Supplemental Listing Document;

“**Stock Exchange**” means The Stock Exchange of Hong Kong Limited; and

“**Valuation Date**” means each of the five Business Days immediately preceding the Expiry Date, provided that if the Issuer determines, in its sole discretion, that a Market Disruption Event has occurred on any Valuation Date, then that Valuation Date shall be postponed until the first succeeding Business Day on which there is no Market Disruption Event irrespective of whether that postponed Valuation Date would fall on a Business Day that is already or is deemed to be a Valuation Date. For the avoidance of doubt, in the event that a Market Disruption Event has occurred and a Valuation Date is postponed as aforesaid, the closing price of the Shares on the first succeeding Business Day will be used more than once in determining the Average Price, so that in no event shall there be less than five closing prices used to determine the Average Price.

If the postponement of the Valuation Date as aforesaid would result in the Valuation Date falling on or after the Expiry Date, then:

(a) the Business Day immediately preceding the Expiry Date (the "**Last Valuation Date**") shall be deemed to be the Valuation Date notwithstanding the Market Disruption Event; and

(b) the Issuer shall determine the closing price of the Shares on the basis of its good faith estimate of the price that would have prevailed on the Last Valuation Date but for the Market Disruption Event.

Trading in Warrants on the Stock Exchange shall cease prior to the Expiry Date in accordance with the requirements of the Stock Exchange.

Other capitalized terms shall, unless otherwise defined herein, have the meaning ascribed to them in the Base Listing Document, the relevant Launch Announcement and Supplemental Listing Document or the Global Certificate.

3. Exercise of Warrants

(A) Warrants may only be exercised in Board Lots or integral multiples thereof.

(B) The Warrants will automatically be exercised on the Expiry Date, if the Issuer determines that the Cash Settlement Amount (calculated in accordance with these Conditions) is positive (without notice being given to the Warrantholders). The Warrantholders will not be required to deliver any exercise notice and the Issuer or its agent will pay to the Warrantholders the Cash Settlement Amount (if any) in accordance with Condition 3(E).

Any Warrant which has not been automatically exercised in accordance with this Condition 3(B) shall expire immediately thereafter and all rights of the Warrantholders and obligations of the Issuer with respect to such Warrant shall cease.

(C) Any Exercise Expenses which are not determined by the Issuer on the Expiry Date and deducted from the Cash Settlement Amount prior to delivery to the Warrantholders in accordance with this Condition 3, shall be notified by the Issuer to the Warrantholders as soon as practicable after determination thereof and shall be paid by the Warrantholders to the Issuer immediately upon demand.

(D) Subject to exercise of Warrants in accordance with these Conditions, or in the event that Warrants have expired worthless, the Issuer will, with effect from the first Business Day following the Expiry Date, remove the name of each Warrantholder from the register of Warrantholders in respect of such Warrants and thereby cancel the relevant Warrants and, if applicable, cancel the Global Certificate.

(E) Upon exercise of Warrants in accordance with these Conditions, the Issuer will pay the Cash Settlement Amount minus the determined Exercise Expenses to the relevant Warrantholder. If the Cash Settlement Amount is equal to or less than the determined Exercise Expenses, no amount is payable.

The aggregate Cash Settlement Amount minus the determined aggregate Exercise Expenses shall be despatched no later than the Settlement Date, by crediting that amount, in accordance with the CCASS Rules, to the relevant bank account designated by each Warrantholder (the "**Designated Bank Account**").

If as a result of an event beyond the control of the Issuer ("**Settlement Disruption Event**"), it is not possible for the Issuer to procure payment electronically through CCASS by crediting the relevant Designated Bank Account of the Warrantholder on the original Settlement Date, the

Issuer shall use its reasonable endeavours to procure payment electronically through CCASS by crediting the relevant Designated Bank Account of the Warrantholder as soon as reasonably practicable after the original Settlement Date. The Issuer will not be liable to the Warrantholder for any interest in respect of the amount due or any loss or damage that such Warrantholder may suffer as a result of the existence of a Settlement Disruption Event.

(F) The Issuer's obligations to pay the Cash Settlement Amount shall be discharged by payment in accordance with Condition 3(E).

4. Sponsor

(A) The Sponsor will not assume any obligation or duty to or any relationship or agency or trust for the Warrantholders.

(B) The Issuer reserves the right, subject to the appointment of a successor, at any time to vary or terminate the appointment of the initial Sponsor and to appoint another sponsor provided that it will at all times maintain a sponsor in Hong Kong for so long as the Warrants are listed on the Stock Exchange. Notice of any such termination or appointment will be given to the Warrantholders in accordance with Condition 9.

5. Adjustments

(A) *Rights Issues.* If and whenever the Company shall, by way of Rights (as defined below), offer new Shares for subscription at a fixed subscription price to the holders of existing Shares pro rata to existing holdings (a "**Rights Offer**"), the Entitlement shall be adjusted to take effect on the Business Day on which trading in the Shares becomes ex-entitlement ("**Rights Issue Adjustment Date**") in accordance with the following formula:

Adjusted Entitlement = Adjustment Component x E

Where:

$$\text{Adjustment Component} = \frac{1 + M}{1 + (R/S) \times M}$$

E: Existing Entitlement immediately prior to the Rights Offer

S: Cum-Rights Share price being the closing price of an existing Share as derived from the Daily Quotation Sheet of the Stock Exchange on the last Business Day on which the Shares are traded on a Cum-Rights basis

R: Subscription price per new Share specified in the Rights Offer plus an amount equal to any dividends or other benefits foregone to exercise the Right

M: Number of new Share(s) (whether a whole or a fraction) per existing Share each holder thereof is entitled to subscribe

Provided that if the above formula would result in an adjustment to the Entitlement which would amount to one per cent. or less of the Entitlement immediately prior to the adjustment, then no adjustment will be made. In addition, the Issuer shall adjust the Exercise Price (which shall be rounded to the nearest 0.001) by the reciprocal of the Adjustment Component, where the "**reciprocal of the Adjustment Component**" means one divided by the relevant Adjustment Component. The adjustment to the Exercise Price shall take effect on the Rights Issue Adjustment Date.

For the purposes of these Conditions:

"**Rights**" means the right(s) attached to each existing Share or needed to acquire one new Share (as the case may be) which are given to the holders of existing Shares to subscribe at a fixed subscription price for new Shares pursuant to the Rights Offer (whether by the exercise of one Right, a part of a Right or an aggregate number of Rights).

(B) *Bonus Issues.* If and whenever the Company shall make an issue of Shares credited as fully paid to the holders of Shares generally by way of capitalisation of profits or reserves (other than pursuant to a scrip dividend or similar scheme for the time being operated by the Company or otherwise in lieu of a cash dividend and without any payment or other consideration being made or given by such holders) (a "**Bonus Issue**") the Entitlement shall be adjusted to take effect on the Business Day on which trading in the Shares becomes ex-entitlement ("**Bonus Issue Adjustment Date**") in accordance with the following formula:

Adjusted Entitlement = Adjustment Component x E

Where:

Adjustment Component = (1 + N)

E: Existing Entitlement immediately prior to the Bonus Issue

N: Number of additional Shares (whether a whole or a fraction) received by a holder of Shares for each Share held prior to the Bonus Issue

Provided that if the above formula would result in an adjustment to the Entitlement which would amount to one per cent. or less of the Entitlement immediately prior to the adjustment, then no adjustment will be made. In addition, the Issuer shall adjust the Exercise Price (which shall be rounded to the nearest 0.001) by the reciprocal of the Adjustment Component, where the "**reciprocal of the Adjustment Component**" means one divided by the relevant Adjustment Component. The adjustment to the Exercise Price shall take effect on the Bonus Issue Adjustment Date.

(C) *Subdivisions and Consolidations.* If and whenever the Company shall subdivide its Shares or any class of its outstanding share capital comprised of the Shares into a greater number of shares (a "**Subdivision**") or consolidate the Shares or any class of its outstanding share capital comprised of the Shares into a smaller number of shares (a "**Consolidation**"), then:

(i) in the case of a Subdivision, the Entitlement in effect immediately prior thereto will be increased whereas the Exercise Price (which shall be rounded to the nearest 0.001) will be decreased in the same ratio as the Subdivision; and

(ii) in the case of a Consolidation, the Entitlement in effect immediately prior thereto will be decreased whereas the Exercise Price (which shall be rounded to the nearest 0.001) will be increased in the same ratio as the Consolidation,

in each case on the day on which the Subdivision or Consolidation (as the case may be) shall have taken effect.

(D) *Restructuring Events.* If it is announced that the Company is to or may merge or consolidate with or into any other corporation (including becoming, by agreement or otherwise, a subsidiary of or controlled by any person or corporation) (except where the Company is the surviving corporation in a merger) or that it is to or may sell or transfer all or substantially all of its assets, the rights attaching to the Warrants may in the absolute discretion of the Issuer be amended no later than the Business Day preceding the consummation of such merger, consolidation, sale or transfer (each a "**Restructuring Event**") (as determined by the Issuer in its absolute discretion) so that the Warrants shall, after such Restructuring Event, relate to the number of shares of the corporation(s) resulting from or surviving such Restructuring Event or other securities ("**Substituted Securities**") and/or cash offered in substitution for the affected Shares, as the case may be, to which the holder of such number of Shares to which the Warrants related immediately before such Restructuring Event would have been entitled upon such Restructuring Event, and thereafter the provisions hereof shall apply to such Substituted Securities, provided that any Substituted Securities may, in the absolute discretion of the Issuer, be deemed to be replaced by an amount in the relevant currency equal to the market value or, if no market value is available, fair value, of such Substituted Securities in each case as determined by the Issuer as soon as practicable after such Restructuring Event is effected. For the avoidance of doubt, any remaining Shares shall not be affected by this paragraph and, where cash is offered in substitution for Shares or is deemed to replace Substituted Securities as described above, references in these Conditions to the Shares shall include any such cash.

(E) *Cash Distribution.* No adjustment will be made for an ordinary cash dividend (whether or not it is offered with a scrip alternative) ("**Ordinary Dividend**"). For any other forms of cash distribution ("**Cash Distribution**") announced by the Company, such as a cash bonus, special dividend or extraordinary dividend, no adjustment will be made unless the value of the Cash Distribution accounts for 2 per cent. or more of the Share's closing price on the day of announcement by the Company.

If and whenever the Company shall make a Cash Distribution credited as fully paid to the holders of Shares generally, the Entitlement shall be adjusted to take effect on the Business Day on which trading in the Shares becomes ex-entitlement in respect of the relevant Cash Distribution ("**Distribution Adjustment Date**") in accordance with the following formula:

Adjusted Entitlement = Adjustment Component x E

Where:

$$\text{Adjustment Component} = \frac{S - OD}{S - OD - CD}$$

E: The existing Entitlement immediately prior to the Cash Distribution

S: Cum-Cash Distribution Share price being the closing price of an existing Share as derived from the Daily Quotation Sheet of the Stock Exchange on the last Business Day on which the Shares are traded on a cum-Cash Distribution basis

CD: The Cash Distribution per Share

OD: The Ordinary Dividend per Share, provided that the Ordinary Dividend and the Cash Distribution have the same ex-entitlement date. For avoidance of doubt, the OD shall be zero if the Ordinary Dividend and the Cash Distribution have different ex-entitlement dates

In addition, the Issuer shall adjust the Exercise Price (which shall be rounded to the nearest 0.001) by the reciprocal of the Adjustment Component, where the "**reciprocal of the Adjustment Component**" means one divided by the relevant Adjustment Component. The adjustment to the Exercise Price shall take effect on the Distribution Adjustment Date.

(F) *Other Adjustments.* Without prejudice to and notwithstanding any prior adjustment(s) made pursuant to the applicable Conditions, the Issuer may (but shall not be obliged to) make such other adjustments to the terms and conditions of the Warrants as appropriate where any event (including the events as contemplated in the applicable Conditions) occurs and irrespective of, in substitution for, or in addition to the provisions contemplated in the applicable Conditions, provided that such adjustment is:

(i) not materially prejudicial to the interests of the Warrantholders generally (without considering the circumstances of any individual Warrantholder or the tax or other consequences of such adjustment in any particular jurisdiction); or

(ii) determined by the Issuer in good faith to be appropriate and commercially reasonable.

(G) *Notice of Adjustments.* All determinations made by the Issuer pursuant hereto will be conclusive and binding on the Warrantholders. The Issuer will give, or procure that there is given, notice as soon as practicable of any adjustment and of the date from which such adjustment is effective by publication in accordance with Condition 9.

6. Purchase

The Issuer or any of its subsidiaries may at any time purchase Warrants at any price in the open market or by tender or by private treaty. Any Warrants so purchased may be held or resold or surrendered for cancellation.

7. Global Certificate

A Global Certificate representing the Warrants will be deposited with CCASS in the name of HKSCC Nominees Limited. The Global Certificate must be executed manually on behalf of the Issuer by authorised person(s) or attorney(s) of the Issuer.

8. Meetings of Warrantholders and Modification

(A) *Meetings of Warrantholders.* The Instrument contains provisions for convening meetings of the Warrantholders to consider any matter affecting their interests, including the sanctioning by Extraordinary Resolution (as defined in the Instrument) of a modification of the provisions of the Warrants or of the Instrument.

Any resolution to be passed in a meeting of the Warrantholders shall be decided by poll. A meeting may be convened by the Issuer or by Warrantholders holding not less than 10 per cent. of the Warrants for the time being remaining unexercised. The quorum at any such meeting for passing an Extraordinary Resolution will be two or more persons holding or representing not less than 25 per cent. of the Warrants for the time being remaining unexercised, or at any adjourned meeting two or more persons being or representing Warrantholders whatever the number of Warrants so held or represented.

A resolution will be an Extraordinary Resolution when it has been passed at a duly convened meeting by not less than three-quarters of the votes cast by such Warrantholders who, being entitled to do so, vote in person or by proxy.

An Extraordinary Resolution passed at any meeting of the Warrantholders shall be binding on all the Warrantholders, whether or not they are present at the meeting.

Resolutions can be passed in writing without a meeting of the Warrantholders being held if passed unanimously.

(B) *Modification.* The Issuer may, without the consent of the Warrantholders, effect any modification of the terms and conditions of the Warrants or the Instrument which, in the opinion of the Issuer, is (i) not materially prejudicial to the interests of the Warrantholders generally (without considering the circumstances of any individual Warrantholder or the tax or other consequences of such modification in any particular jurisdiction); (ii) of a formal, minor or technical nature; (iii) made to correct a manifest error; or (iv) necessary in order to comply with mandatory provisions of the laws or regulations of Hong Kong. Any such modification shall be binding on the Warrantholders and shall be notified to them by the Issuer as soon as practicable thereafter in accordance with Condition 9.

9. Notices

All notices to the Warrantholders will be validly given if published in English and in Chinese on the HKEX website. In such circumstances, the Issuer shall not be required to despatch copies of the notice to the Warrantholders.

10. Liquidation

In the event of a liquidation or dissolution of the Company or the appointment of a liquidator, receiver or administrator or analogous person under any applicable law in respect of the whole or substantially the whole of its undertaking, property or assets, all unexercised Warrants will lapse and shall cease to be valid for any purpose. In the case of voluntary liquidation, the unexercised Warrants will lapse and shall cease to be valid on the effective date of the relevant resolution and, in the case of an involuntary liquidation or dissolution, on the date of the relevant court order or, in the case of the appointment of a liquidator or receiver or administrator or analogous person under any applicable law in respect of the whole or substantially the whole of its undertaking, property or assets, on the date when such appointment is effective but subject (in any such case) to any contrary mandatory requirement of law.

11. Further Issues

The Issuer shall be at liberty from time to time, without the consent of the Warrantholders, to create and issue further warrants so as to form a single series with the Warrants.

12. Delisting

(A) If at any time the Shares cease to be listed on the Stock Exchange, the Issuer shall give effect to these Conditions in such manner and make such adjustments and amendments to the rights attaching to the Warrants as it shall, in its absolute discretion, consider appropriate to ensure, so far as it is reasonably able to do so, that the interests of the Warrantholders generally are not materially prejudiced as a consequence of such delisting (without considering the circumstances of any individual Warrantholder or the tax or other consequences that may result in any particular jurisdiction).

(B) Without prejudice to the generality of Condition 12(A), where the Shares are, or, upon the delisting, become, listed on any other stock exchange, these Conditions may, in the absolute discretion of the Issuer, be amended to the extent necessary to allow for the substitution of that other stock exchange in place of the Stock Exchange and the Issuer may, without the consent of the Warrantholders, make such adjustments to the entitlements of the Warrantholders on exercise (including, if appropriate, by converting foreign currency amounts at prevailing market rates into the relevant currency) as may be appropriate in the circumstances.

(C) The Issuer shall determine, in its absolute discretion, any adjustment or amendment and its determination shall be conclusive and binding on the Warrantholders save in the case of manifest error. Notice of any adjustments or amendments shall be given to the Warrantholders in accordance with Condition 9 as soon as practicable after they are determined.

13. Illegality or Impracticability

The Issuer is entitled to terminate the Warrants if it determines in good faith and in a commercially reasonable manner that, for reasons beyond its control, it has become or it will become illegal or impracticable:

(i) for it to perform its obligations under the Warrants in whole or in part as a result of:

(a) the adoption of, or any change in, any relevant law or regulation (including any tax law); or

(b) the promulgation of, or any change in, the interpretation by any court, tribunal, governmental, administrative, legislative, regulatory or judicial authority or power with competent jurisdiction of any relevant law or regulation (including any tax law),

(each of (a) and (b), a "**Change in Law Event**"); or

(ii) for it or any of its affiliates to maintain the Issuer's hedging arrangements with respect to the Warrants due to a Change in Law Event.

Upon the occurrence of a Change in Law Event, the Issuer will, if and to the extent permitted by the applicable law or regulation, pay to each Warrantholder a cash amount that the Issuer determines in good faith and in a commercially reasonable manner to be the fair market value in respect of each Warrant held by such Warrantholder immediately prior to such termination (ignoring such illegality or impracticability) less the cost to the Issuer of unwinding any related hedging arrangement as determined by the Issuer in its sole and absolute discretion. Payment will be made to each Warrantholder in such manner as shall be notified to the Warrantholder in accordance with Condition 9.

14. Good Faith and Commercially Reasonable Manner

Any exercise of discretion by the Issuer under these Conditions will be made in good faith and in a commercially reasonable manner.

15. Governing Law

The Warrants and the Instrument are governed by and construed in accordance with the laws of the Hong Kong Special Administrative Region of the People's Republic of China ("**Hong Kong**"). The Issuer and each Warrantholder (by its purchase of the Warrants) submit for all purposes in connection with the Warrants and the Instrument to the non-exclusive jurisdiction of the courts of Hong Kong.

16. Contracts (Rights of Third Parties) Ordinance

A person who is not a party to these Conditions has no right under the Contracts (Rights of Third Parties) Ordinance (Cap. 623 of the Laws of Hong Kong) to enforce or to enjoy the benefit of any term of the Warrants.

17. Language

A Chinese translation of these Conditions will be made available for collection during normal office hours from the Sponsor at 52nd Floor, Two International Finance Centre, 8 Finance Street, Central, Hong Kong. In the event of any inconsistency between the Chinese translation and the English version of these Conditions, the English version of these Conditions shall prevail.

18. Prescription

Claims against the Issuer for payment of any amount in respect of the Warrants will become void unless made within ten years of the Expiry Date and thereafter, any sums payable in respect of such Warrants shall be forfeited and shall revert to the Issuer.

Sponsor:
UBS Securities Asia Limited
52nd Floor
Two International Finance Centre
8 Finance Street, Central
Hong Kong

PART B — TERMS AND CONDITIONS OF CASH SETTLED INDEX WARRANTS

These Conditions will, together with the supplemental provisions contained in the relevant Launch Announcement and Supplemental Listing Document, and subject to completion and amendment, be endorsed on the Global Certificate. The relevant Launch Announcement and Supplemental Listing Document in relation to the issue of any series of Warrants may specify other terms and conditions which shall, to the extent so specified or to the extent they are inconsistent with these Conditions, replace or modify these Conditions for the purpose of such series of Warrants.

1. Form, Status, Transfer, Title and Additional Costs and Expenses

(A) The Warrants (which expression shall, unless the context otherwise requires, include any further warrants issued pursuant to Condition 10) relating to the Index are issued in registered form subject to and with the benefit of an instrument by way of deed poll (the "**Instrument**" as defined more fully in the relevant Launch Announcement and Supplemental Listing Document) executed by UBS AG (the "**Issuer**") acting through its London branch or any of its branches outside Switzerland as it may specify from time to time. The Warrantholders (as defined below) are entitled to the benefit of, are bound by, and are deemed to have notice of all the provisions of the Instrument. A copy of the Instrument is available for inspection at UBS Securities Asia Limited ("**Sponsor**") at 52nd Floor, Two International Finance Centre, 8 Finance Street, Central, Hong Kong.

The Warrants are represented by a global certificate ("**Global Certificate**") registered in the name of HKSCC Nominees Limited (or such other nominee company as may be used by Hong Kong Securities Clearing Company Limited ("**HKSCC**") from time to time in relation to the provision of nominee services to persons admitted for the time being by HKSCC as a participant of CCASS) (the "**Nominee**"). No definitive certificate will be issued. The Warrants can only be exercised by HKSCC or the Nominee.

(B) The settlement obligation of the Issuer in respect of the Warrants represents general unsecured contractual obligations of the Issuer and of no other person which rank, and will rank, equally among themselves and pari passu with all other present and future unsecured and unsubordinated contractual obligations of the Issuer, except for obligations accorded preference by mandatory provisions of applicable law.

Warrants represent general contractual obligations of the Issuer, and are not, nor is it the intention (expressed, implicit or otherwise) of the Issuer to create by the issue of Warrants deposit liabilities of the Issuer or a debt obligation of any kind.

(C) Transfers of Warrants may be effected only in Board Lots or integral multiples thereof in CCASS in accordance with the General Rules of CCASS and the CCASS Operational Procedures in effect from time to time (the "**CCASS Rules**").

(D) Each person who is for the time being shown in the register kept by the Issuer in Hong Kong as the holder shall be treated by the Issuer and the Sponsor as the absolute owner and holder of the Warrants. The expressions "**Warrantholder**" and "**Warrantholders**" shall be construed accordingly.

(E) Warrantholders are responsible for additional costs and expenses in connection with any exercise of the Warrants including the Exercise Expenses (as defined below) which amount shall, subject to Condition 2(B) and to the extent necessary, be payable to the Issuer and collected from the Warrantholders.

2. Warrant Rights and Exercise Expenses

(A) Every Board Lot entitles the Warrantholders, upon due exercise and upon compliance with these Conditions, in particular Condition 3, to payment of the Cash Settlement Amount (as defined below), if any.

(B) The Warrantholders will be required to pay a sum equal to all the expenses resulting from the exercise of such Warrants. To effect such payment an amount equivalent to the Exercise Expenses (defined below) shall be deducted from the Cash Settlement Amount in accordance with Condition 3(E).

(C) For the purposes of these Conditions:

"**Board Lot**" has the meaning given to it in the relevant Launch Announcement and Supplemental Listing Document;

"**Business Day**" means a day (excluding Saturdays) on which the Stock Exchange is scheduled to open for dealings in Hong Kong and banks are open for business in Hong Kong;

"**Cash Settlement Amount**" means, for every Board Lot, an amount calculated by the Issuer in accordance with the following formula (and, if appropriate, either (i) converted (if applicable) into the Settlement Currency at the Exchange Rate or, as the case may be, (ii) converted into the Interim Currency at the First Exchange Rate and then (if applicable) converted into Settlement Currency at the Second Exchange Rate):

(i) In the case of a series of call Warrants:

$$\text{Cash Settlement Amount per Board Lot} = \frac{(\text{Closing Level - Strike Level}) \text{ x one Board Lot x Index Currency Amount}}{\text{Divisor}}$$

(ii) In the case of a series of put Warrants:

$$\text{Cash Settlement Amount per Board Lot} = \frac{(\text{Strike Level - Closing Level}) \text{ x one Board Lot x Index Currency Amount}}{\text{Divisor}}$$

For the avoidance of doubt, if the Cash Settlement Amount is a negative figure, it shall be deemed to be zero;

"**CCASS**" means the Central Clearing and Settlement System;

"**CCASS Settlement Day**" has the meaning ascribed to the term "Settlement Day" in the CCASS Rules, subject to such modification and amendment prescribed by HKSCC from time to time;

"**Closing Level**" means the level specified as such in the relevant Launch Announcement and Supplemental Listing Document subject to any adjustment in accordance with Condition 5;

"**Divisor**" means the number specified as such in the relevant Launch Announcement and Supplemental Listing Document;

"**Exchange Rate**" means the rate specified as such in the relevant Launch Announcement and Supplemental Listing Document;

"**Exercise Expenses**" means any charges or expenses including any taxes or duties which are incurred in respect of the exercise of a Board Lot of Warrants;

"**Expiry Date**" means the date specified as such in the relevant Launch Announcement and Supplemental Listing Document;

"**First Exchange Rate**" means the rate specified as such in the relevant Launch Announcement and Supplemental Listing Document;

"**HKEX**" means Hong Kong Exchanges and Clearing Limited;

"**Index**" means the index specified as such in the relevant Launch Announcement and Supplemental Listing Document;

"**Index Business Day**" means any day on which the Index Exchange is scheduled to open for trading for its regular trading sessions;

"**Index Compiler**" means the index compiler specified as such in the relevant Launch Announcement and Supplemental Listing Document;

"**Index Currency Amount**" has the meaning given to it in the relevant Launch Announcement and Supplemental Listing Document;

"**Index Exchange**" means the index exchange specified as such in the relevant Launch Announcement and Supplemental Listing Document;

"**Interim Currency**" means the currency specified in the relevant Launch Announcement and Supplemental Listing Document;

"**Listing Date**" means the date specified as such in the relevant Launch Announcement and Supplemental Listing Document;

"**Market Disruption Event**" means:

(i) the occurrence or existence, on the Valuation Date during the one-half hour period that ends at the close of trading on the Index Exchange, of any of:

(1) the suspension or material limitation of the trading of a material number of constituent securities that comprise the Index;

(2) the suspension or material limitation of the trading of options or futures contracts relating to the Index on any exchanges on which such contracts are traded; or

(3) the imposition of any exchange controls in respect of any currencies involved in determining the Cash Settlement Amount.

For the purposes of this paragraph (i), (a) the limitation of the number of hours or days of trading will not constitute a Market Disruption Event if it results from an announced change in the regular business hours of any relevant exchange, and (b) a limitation on trading imposed by reason of the movements in price exceeding the levels permitted by any relevant exchange will constitute a Market Disruption Event;

(ii) where the Index Exchange is the Stock Exchange, the issuance of the tropical cyclone warning signal number 8 or above or the issuance of a "BLACK" rainstorm signal on any day which either (i) results in the Stock Exchange being closed for trading for the entire day; or (ii) results in the Stock Exchange being closed prior to its regular time for close of trading for the relevant day (for the avoidance of doubt, in the case when the Stock Exchange is scheduled to open for the morning trading session only, closed prior to its regular time for close of trading for the morning session), PROVIDED THAT there shall be no Market Disruption Event solely by reason of the Stock Exchange opening for trading later than its regular time for opening of trading on any day as a result of the tropical cyclone warning signal number 8 or above or the "BLACK" rainstorm signal having been issued;

(iii) a limitation or closure of the Index Exchange due to any unforeseen circumstances; or

(iv) any circumstances beyond the control of the Issuer in which the Closing Level or, if applicable, the Exchange Rate, the First Exchange Rate or the Second Exchange Rate (as the case may be) cannot be determined by the Issuer in the manner set out in these Conditions or in such other manner as the Issuer considers appropriate at such time after taking into account all the relevant circumstances.

"**Second Exchange Rate**" means the rate specified as such in the relevant Launch Announcement and Supplemental Listing Document;

"**Settlement Currency**" means the currency specified as such in the relevant Launch Announcement and Supplemental Listing Document;

"**Settlement Date**" means the third CCASS Settlement Day after the later of: (i) the Expiry Date; and (ii) the day on which the Closing Level is determined in accordance with the Conditions;

"**Stock Exchange**" means The Stock Exchange of Hong Kong Limited;

"**Strike Level**" means the level specified as such in the relevant Launch Announcement and Supplemental Listing Document; and

"**Valuation Date**" means the date specified in the relevant Launch Announcement and Supplemental Listing Document.

Trading in Warrants on the Stock Exchange shall cease prior to the Expiry Date in accordance with the requirements of the Stock Exchange.

Other capitalised terms shall, unless otherwise defined herein, bear the meaning ascribed to them in the Base Listing Document, the relevant Launch Announcement and Supplemental Listing Document or the Global Certificate.

3. Exercise of Warrants

(A) Warrants may only be exercised in Board Lots or integral multiples thereof.

(B) The Warrants will automatically be exercised on the Expiry Date, if the Issuer determines that the Cash Settlement Amount (calculated in accordance with these Conditions) is positive (without notice being given to the Warrantholders). The Warrantholders will not be required to deliver any exercise notice and the Issuer or its agent will pay to the Warrantholders the Cash Settlement Amount (if any) in accordance with Condition 3(E).

Any Warrant which has not been automatically exercised in accordance with this Condition 3(B) shall expire immediately thereafter and all rights of the Warrantholders and obligations of the Issuer with respect to such Warrant shall cease.

(C) Any Exercise Expenses which are not determined by the Issuer on the Expiry Date and deducted from the Cash Settlement Amount prior to delivery to the Warrantholders in accordance with this Condition 3, shall be notified by the Issuer to the Warrantholders as soon as practicable after determination thereof and shall be paid by the Warrantholders to the Issuer immediately upon demand.

(D) Subject to exercise of Warrants in accordance with these Conditions, or in the event that Warrants have expired worthless, the Issuer will, with effect from the first Business Day following the Expiry Date, remove the name of each Warrantholder from the register of Warrantholders in respect of such Warrants and thereby cancel the relevant Warrants and, if applicable, cancel the Global Certificate.

(E) Upon exercise of Warrants in accordance with these Conditions, the Issuer will pay the Cash Settlement Amount minus the determined Exercise Expenses to the relevant Warrantholder. If the Cash Settlement Amount is equal to or less than the determined Exercise Expenses, no amount is payable.

The aggregate Cash Settlement Amount minus the determined aggregate Exercise Expenses shall be despatched no later than the Settlement Date, by crediting that amount, in accordance with the CCASS Rules, to the relevant bank account designated by a Warrantholder (the "**Designated Bank Account**").

If as a result of an event beyond the control of the Issuer ("**Settlement Disruption Event**"), it is not possible for the Issuer to procure payment electronically through CCASS by crediting the relevant Designated Bank Account of a Warrantholder on the original Settlement Date, the Issuer shall use its reasonable endeavours to procure payment electronically through CCASS by crediting the relevant Designated Bank Account of the Warrantholder as soon as reasonably practicable after the original Settlement Date. The Issuer will not be liable to the Warrantholder for any interest in respect of the amount due or any loss or damage that such Warrantholder may suffer as a result of the existence of a Settlement Disruption Event.

If the Issuer determines, in its sole discretion, that a Market Disruption Event has occurred on the Valuation Date, then the Issuer shall determine the Closing Level on the basis of its good faith estimate of the Closing Level that would have prevailed on that day but for the occurrence of the Market Disruption Event provided that the Issuer, if applicable, may, but shall not be obliged to, determine such Closing Level by having regard to the manner in which futures contracts relating to the Index are calculated.

(F) The Issuer's obligations to pay the Cash Settlement Amount shall be discharged by payment in accordance with Condition 3(E).

4. Sponsor

(A) The Sponsor will not assume any obligation or duty to or any relationship or agency or trust for the Warrantholders.

(B) The Issuer reserves the right, subject to the appointment of a successor, at any time to vary or terminate the appointment of the initial Sponsor and to appoint another agent provided that it will at all times maintain a sponsor in Hong Kong for so long as the Warrants are listed on the Stock Exchange. Notice of any such termination or appointment will be given to the Warrantholders in accordance with Condition 9.

5. Adjustments to the Index

(A) *Successor Index Compiler Calculates and Reports Index.* If the Index is (i) not calculated and announced by the Index Compiler but is calculated and published by a successor to the Index Compiler (the "**Successor Index Compiler**") acceptable to the Issuer or (ii) replaced by a successor index using, in the determination of the Issuer, the same or a substantially similar formula for and method of calculation as used in the calculation of the Index, then the Index will be deemed to be the index so calculated and announced by the Successor Index Compiler or that successor index, as the case may be.

(B) *Modification and Cessation of Calculation of Index.* If (i) on or prior to the Valuation Date the Index Compiler or (if applicable) the Successor Index Compiler makes a material change in the formula for or the method of calculating the Index or in any other way materially modifies the Index (other than a modification prescribed in that formula or method to maintain the Index in the event of changes in constituent securities, contracts or commodities and other routine events), or (ii) on the Valuation Date the Index Compiler or (if applicable) the Successor Index Compiler fails to calculate and publish the Index (other than as a result of a Market Disruption Event), then the Issuer shall determine the Closing Level using, in lieu of a published level for the Index, the level for the Index as at the Valuation Date as determined by the Issuer in accordance with the formula for and method of calculating the Index last in effect prior to that change or failure, but using only those securities, contracts or commodities that comprised the Index immediately prior to that change or failure (other than those securities that have since ceased to be listed on the relevant exchange).

(C) *Other Adjustments.* Without prejudice to and notwithstanding any prior adjustment(s) made pursuant to the applicable Conditions, the Issuer may (but shall not be obliged to) make such other adjustments to the terms and conditions of the Warrants as appropriate where any event (including the events as contemplated in the applicable Conditions) occurs and irrespective of, in substitution for, or in addition to the provisions contemplated in the applicable Conditions, provided that such adjustment is:

(i) not materially prejudicial to the interests of the Warrantholders generally (without considering the circumstances of any individual Warrantholder or the tax or other consequences of such adjustment in any particular jurisdiction); or

(ii) determined by the Issuer in good faith to be appropriate and commercially reasonable.

(D) *Notice of Adjustments.* All determinations made by the Issuer pursuant hereto will be conclusive and binding on the Warrantholders. The Issuer will give, or procure that there is given, notice as soon as practicable of any adjustment and of the date from which such adjustment is effective by publication in accordance with Condition 9.

6. Purchase

The Issuer or any of its subsidiaries may at any time purchase Warrants at any price in the open market or by tender or by private treaty. Any Warrants so purchased may be held or resold or surrendered for cancellation.

7. Global Certificate

A Global Certificate representing the Warrants will be deposited with CCASS in the name of HKSCC Nominees Limited. The Global Certificate must be executed manually on behalf of the Issuer by authorised officer(s) or attorney(s) of the Issuer.

8. Meetings of Warrantholders and Modification

(A) *Meetings of Warrantholders.* The Instrument contains provisions for convening meetings of the Warrantholders to consider any matter affecting their interests, including the sanctioning by Extraordinary Resolution (as defined in the Instrument) of a modification of the provisions of the Warrants or of the Instrument.

Any resolution to be passed in a meeting of the Warrantholders shall be decided by poll. Such a meeting may be convened by the Issuer or by Warrantholders holding not less than 10 per cent. of the Warrants for the time being remaining unexercised. The quorum at any such meeting for passing an Extraordinary Resolution will be two or more persons holding or representing not less than 25 per cent. of the Warrants for the time being remaining unexercised, or at any adjourned meeting two or more persons being or representing Warrantholders whatever the number of Warrants so held or represented.

A resolution will be an Extraordinary Resolution when it has been passed at a duly convened meeting by not less than three-quarters of the votes cast by such Warrantholders who, being entitled to do so, vote in person or by proxy.

An Extraordinary Resolution passed at any meeting of the Warrantholders shall be binding on all the Warrantholders, whether or not they are present at the meeting.

Resolutions can be passed in writing without a meeting of the Warrantholders being held if passed unanimously.

(B) *Modification.* The Issuer may, without the consent of the Warrantholders, effect any modification of the terms and conditions of the Warrants or the Instrument which, in the opinion of the Issuer, is (i) not materially prejudicial to the interests of the Warrantholders generally (without considering the circumstances of any individual Warrantholder or the tax or other consequences of such modification in any particular jurisdiction); (ii) of a formal, minor or technical nature; (iii) made to correct a manifest error; or (iv) necessary in order to comply with mandatory provisions of the laws or regulations of Hong Kong. Any such modification shall be binding on the Warrantholders and shall be notified to them by the Issuer as soon as practicable thereafter in accordance with Condition 9.

9. Notices

All notices to the Warrantholders will be validly given if published in English and in Chinese on the HKEX website. In such circumstances, the Issuer shall not be required to despatch copies of the notice to the Warrantholders.

10. Further Issues

The Issuer shall be at liberty from time to time, without the consent of the Warrantholders, to create and issue further warrants so as to form a single series with the Warrants.

11. Illegality or Impracticability

The Issuer is entitled to terminate the Warrants if it determines in good faith and in a commercially reasonable manner that, for reasons beyond its control, it has become or it will become illegal or impracticable:

(i) for it to perform its obligations under the Warrants in whole or in part as a result of:

(a) the adoption of, or any change in, any relevant law or regulation (including any tax law); or

(b) the promulgation of, or any change in, the interpretation by any court, tribunal, governmental, administrative, legislative, regulatory or judicial authority or power with competent jurisdiction of any relevant law or regulation (including any tax law),

(each of (a) and (b), a "**Change in Law Event**"); or

(ii) for it or any of its affiliates to maintain the Issuer's hedging arrangements with respect to the Warrants due to a Change in Law Event.

Upon the occurrence of a Change in Law Event, the Issuer will, if and to the extent permitted by the applicable law or regulation, pay to each Warrantholder a cash amount that the Issuer determines in good faith and in a commercially reasonable manner to be the fair market value in respect of each Warrant held by such Warrantholder immediately prior to such termination (ignoring such illegality or impracticability) less the cost to the Issuer of unwinding any related hedging arrangement as determined by the Issuer in its sole and absolute discretion. Payment will be made to each Warrantholder in such manner as shall be notified to the Warrantholder in accordance with Condition 9.

12. Good Faith and Commercially Reasonable Manner

Any exercise of discretion by the Issuer under these Conditions will be made in good faith and in a commercially reasonable manner.

13. Governing Law

The Warrants and the Instrument are governed by and construed in accordance with the laws of the Hong Kong Special Administrative Region of the People's Republic of China ("**Hong Kong**"). The Issuer and each Warrantholder (by its purchase of the Warrants) submit for all purposes in connection with the Warrants and the Instrument to the non-exclusive jurisdiction of the courts of Hong Kong.

14. Contracts (Rights of Third Parties) Ordinance

A person who is not a party to these Conditions has no right under the Contracts (Rights of Third Parties) Ordinance (Cap. 623 of the Laws of Hong Kong) to enforce or to enjoy the benefit of any term of the Warrants.

15. Language

A Chinese translation of these Conditions will be made available for collection during normal office hours from the Sponsor at 52nd Floor, Two International Finance Centre, 8 Finance Street, Central, Hong Kong. In the event of any inconsistency between the Chinese translation and the English version of these Conditions, the English version of these Conditions shall prevail.

16. Prescription

Claims against the Issuer for payment of any amount in respect of the Warrants will become void unless made within ten years of the Expiry Date and thereafter, any sums payable in respect of such Warrants shall be forfeited and shall revert to the Issuer.

Sponsor:
UBS Securities Asia Limited
52nd Floor
Two International Finance Centre
8 Finance Street, Central
Hong Kong

PART C — TERMS AND CONDITIONS OF CASH SETTLED WARRANTS OVER SINGLE UNIT TRUSTS

These Conditions will, together with the supplemental provisions contained in the relevant Launch Announcement and Supplemental Listing Document, and subject to completion and amendment, be endorsed on the Global Certificate. The relevant Launch Announcement and Supplemental Listing Document in relation to the issue of any series of Warrants may specify other terms and conditions which shall, to the extent so specified or to the extent they are inconsistent with these Conditions, replace or modify these Conditions for the purpose of such series of Warrants.

1. Form, Status, Transfer, Title and Additional Costs and Expenses

(A) The Warrants (which expression shall, unless the context otherwise requires, include any further warrants issued pursuant to Condition 11) relating to the Units of the Trust are issued in registered form subject to and with the benefit of an instrument by way of deed poll (the "**Instrument**" as defined more fully in the relevant Launch Announcement and Supplemental Listing Document) executed by UBS AG (the "**Issuer**") acting through its London branch or any of its branches outside Switzerland as it may specify from time to time. The Warrantholders (as defined below) are entitled to the benefit of, are bound by, and are deemed to have notice of all the provisions of the Instrument. A copy of the Instrument is available for inspection at the offices of UBS Securities Asia Limited ("**Sponsor**") at 52nd Floor, Two International Finance Centre, 8 Finance Street, Central, Hong Kong.

The Warrants are represented by a global certificate ("**Global Certificate**") registered in the name of HKSCC Nominees Limited (or such other nominee company as may be used by Hong Kong Securities Clearing Company Limited ("**HKSCC**") from time to time in relation to the provision of nominee services to persons admitted for the time being by HKSCC as a participant of CCASS) (the "**Nominee**"). No definitive certificate will be issued. The Warrants can only be exercised by HKSCC or the Nominee.

(B) The settlement obligation of the Issuer in respect of the Warrants represents general unsecured contractual obligations of the Issuer and of no other person which rank, and will rank, equally among themselves and pari passu with all other present and future unsecured and unsubordinated contractual obligations of the Issuer, except for obligations accorded preference by mandatory provisions of applicable law.

Warrants represent general contractual obligations of the Issuer, and are not, nor is it the intention (expressed, implicit or otherwise) of the Issuer to create by the issue of Warrants deposit liabilities of the Issuer or a debt obligation of any kind.

(C) Transfers of Warrants may be effected only in Board Lots or integral multiples thereof in CCASS in accordance with the General Rules of CCASS and the CCASS Operational Procedures in effect from time to time (the "**CCASS Rules**").

(D) Each person who is for the time being shown in the register kept by the Issuer in Hong Kong as the holder shall be treated by the Issuer and the Sponsor as the absolute owner and holder of the Warrants. The expressions "**Warrantholder**" and "**Warrantholders**" shall be construed accordingly.

(E) Warrantholders are responsible for additional costs and expenses in connection with any exercise of the Warrants including the Exercise Expenses (as defined below) which amount shall, subject to Condition 2(B) and to the extent necessary, be payable to the Issuer and collected from the Warrantholders.

2. Warrant Rights and Exercise Expenses

(A) Every Board Lot entitles the Warrantholders, upon due exercise and upon compliance with these Conditions, in particular Condition 3, to payment of the Cash Settlement Amount (as defined below), if any.

(B) The Warrantholders will be required to pay a sum equal to all the expenses resulting from the exercise of such Warrants. To effect such payment an amount equivalent to the Exercise Expenses (defined below) shall be deducted from the Cash Settlement Amount in accordance with Condition 3(E).

(C) For the purposes of these Conditions:

"**Average Price**" means the arithmetic mean of the closing prices of one Unit (as derived from the Daily Quotation Sheet of the Stock Exchange, subject to any adjustment to such closing prices as may be necessary to reflect event as contemplated in Condition 5 such as capitalisation, rights issue, distribution or the like) in respect of each Valuation Date;

"**Board Lot**" has the meaning given to it in the relevant Launch Announcement and Supplemental Listing Document;

"**Business Day**" means a day (excluding Saturdays) on which the Stock Exchange is scheduled to open for dealings in Hong Kong and banks are open for business in Hong Kong;

"**Cash Settlement Amount**" means, for every Board Lot, an amount in the Settlement Currency calculated by the Issuer in accordance with the following formula:

(i) In the case of a series of call Warrants:

$$\text{Cash Settlement Amount per Board Lot} = \frac{\text{Entitlement x (Average Price - Exercise Price) x one Board Lot}}{\text{Number of Warrant(s) per Entitlement}}$$

(ii) In the case of a series of put Warrants:

$$\text{Cash Settlement Amount per Board Lot} = \frac{\text{Entitlement x (Exercise Price - Average Price) x one Board Lot}}{\text{Number of Warrant(s) per Entitlement}}$$

For the avoidance of doubt, if the Cash Settlement Amount is a negative figure, it shall be deemed to be zero;

"**CCASS**" means the Central Clearing and Settlement System;

"**CCASS Settlement Day**" has the meaning ascribed to the term "Settlement Day" in the CCASS Rules, subject to such modification and amendment prescribed by HKSCC from time to time;

"**Entitlement**" means the number specified as such in the relevant Launch Announcement and Supplemental Listing Document, subject to any adjustment in accordance with Condition 5;

"**Exercise Expenses**" means any charges or expenses including any taxes or duties which are incurred in respect of the exercise of a Board Lot of Warrants;

"**Exercise Price**" means the price specified as such in the relevant Launch Announcement and Supplemental Listing Document, subject to any adjustment in accordance with Condition 5;

"**Expiry Date**" means the date specified as such in the relevant Launch Announcement and Supplemental Listing Document;

"**HKEX**" means Hong Kong Exchanges and Clearing Limited;

"**Listing Date**" means the date specified as such in the relevant Launch Announcement and Supplemental Listing Document;

"**Market Disruption Event**" means:

(1) the occurrence or existence on any Valuation Date during the one-half hour period that ends at the close of trading of any suspension of or limitation imposed on trading (by reason of movements in price exceeding limits permitted by the Stock Exchange or otherwise) on the Stock Exchange in (a) the Units; or (b) any options or futures contracts relating to the Units if, in any such case, such suspension or limitation is, in the determination of the Issuer, material;

(2) the issuance of the tropical cyclone warning signal number 8 or above or the issuance of a "BLACK" rainstorm signal on any day which either (i) results in the Stock Exchange being closed for trading for the entire day; or (ii) results in the Stock Exchange being closed prior to its regular time for close of trading for the relevant day (for the avoidance of doubt, in the case when the Stock Exchange is scheduled to open for the morning trading session only, closed prior to its regular time for close of trading for the morning session), PROVIDED THAT there shall be no Market Disruption Event solely by reason of the Stock Exchange opening for trading later than its regular time for opening of trading on any day as a result of the tropical cyclone warning signal number 8 or above or the "BLACK" rainstorm signal having been issued; or

(3) a limitation or closure of the Stock Exchange due to any unforeseen circumstances;

"**Settlement Currency**" means the currency specified as such in the relevant Launch Announcement and Supplemental Listing Document;

"**Settlement Date**" means the third CCASS Settlement Day after the later of: (i) the Expiry Date; and (ii) the day on which the Average Price is determined in accordance with the Conditions;

"**Stock Exchange**" means The Stock Exchange of Hong Kong Limited;

"**Trust**" means the trust specified as such in the relevant Launch Announcement and Supplemental Listing Document;

"**Unit**" means the unit specified as such in the relevant Launch Announcement and Supplemental Listing Document; and

"**Valuation Date**" means each of the five Business Days immediately preceding the Expiry Date, provided that if the Issuer determines, in its sole discretion, that a Market Disruption Event has occurred on any Valuation Date, then that Valuation Date shall be postponed until the first succeeding Business Day on which there is no Market Disruption Event irrespective of whether that postponed Valuation Date would fall on a Business Day that is already or is deemed to be a Valuation Date. For the avoidance of doubt, in the event that a Market Disruption Event has occurred and a Valuation Date is postponed as aforesaid, the closing price of the Units on the first succeeding Business Day will be used more than once in determining the Average Price, so that in no event shall there be less than five closing prices used to determine the Average Price.

If the postponement of the Valuation Date as aforesaid would result in the Valuation Date falling on or after the Expiry Date, then:

(a) the Business Day immediately preceding the Expiry Date (the "**Last Valuation Date**") shall be deemed to be the Valuation Date notwithstanding the Market Disruption Event; and

(b) the Issuer shall determine the closing price of the Units on the basis of its good faith estimate of the price that would have prevailed on the Last Valuation Date but for the Market Disruption Event.

Trading in Warrants on the Stock Exchange shall cease prior to the Expiry Date in accordance with the requirements of the Stock Exchange.

Other capitalized terms shall, unless otherwise defined herein, have the meaning ascribed to them in the Base Listing Document, the relevant Launch Announcement and Supplemental Listing Document or the Global Certificate.

3. Exercise of Warrants

(A) Warrants may only be exercised in Board Lots or integral multiples thereof.

(B) The Warrants will automatically be exercised on the Expiry Date, if the Issuer determines that the Cash Settlement Amount (calculated in accordance with these Conditions) is positive (without notice being given to the Warrantholders). The Warrantholders will not be required to deliver any exercise notice and the Issuer or its agent will pay to the Warrantholders the Cash Settlement Amount (if any) in accordance with Condition 3(E).

Any Warrant which has not been automatically exercised in accordance with this Condition 3(B) shall expire immediately thereafter and all rights of the Warrantholders and obligations of the Issuer with respect to such Warrant shall cease.

(C) Any Exercise Expenses which are not determined by the Issuer on the Expiry Date and deducted from the Cash Settlement Amount prior to delivery to the Warrantholders in accordance with this Condition 3, shall be notified by the Issuer to the Warrantholders as soon as practicable after determination thereof and shall be paid by the Warrantholders to the Issuer immediately upon demand.

(D) Subject to exercise of Warrants in accordance with these Conditions, or in the event that Warrants have expired worthless, the Issuer will, with effect from the first Business Day following the Expiry Date, remove the name of each Warrantholder from the register of Warrantholders in respect of such Warrants and thereby cancel the relevant Warrants and, if applicable, cancel the Global Certificate.

(E) Upon exercise of Warrants in accordance with these Conditions, the Issuer will pay the Cash Settlement Amount minus the determined Exercise Expenses to the relevant Warrantholder. If the Cash Settlement Amount is equal to or less than the determined Exercise Expenses, no amount is payable.

The aggregate Cash Settlement Amount minus the determined aggregate Exercise Expenses shall be despatched no later than the Settlement Date, by crediting that amount, in accordance with the CCASS Rules, to the relevant bank account designated by each Warrantholder (the "**Designated Bank Account**").

If as a result of an event beyond the control of the Issuer ("**Settlement Disruption Event**"), it is not possible for the Issuer to procure payment electronically through CCASS by crediting the relevant Designated Bank Account of the Warrantholder on the original Settlement Date, the Issuer shall use its reasonable endeavours to procure payment electronically through CCASS by crediting the relevant Designated Bank Account of the Warrantholder as soon as reasonably practicable after the original Settlement Date. The Issuer will not be liable to the Warrantholder for any interest in respect of the amount due or any loss or damage that such Warrantholder may suffer as a result of the existence of a Settlement Disruption Event.

(F) The Issuer's obligations to pay the Cash Settlement Amount shall be discharged by payment in accordance with Condition 3(E).

4. Sponsor

(A) The Sponsor will not assume any obligation or duty to or any relationship or agency or trust for the Warrantholders.

(B) The Issuer reserves the right, subject to the appointment of a successor, at any time to vary or terminate the appointment of the initial Sponsor and to appoint another sponsor provided that it will at all times maintain a sponsor in Hong Kong for so long as the Warrants are listed on the Stock Exchange. Notice of any such termination or appointment will be given to the Warrantholders in accordance with Condition 9.

5. Adjustments

(A) *Rights Issues.* If and whenever the Trust shall, by way of Rights (as defined below), offer new Units for subscription at a fixed subscription price to the holders of existing Units pro rata to existing holdings (a "**Rights Offer**"), the Entitlement shall be adjusted to take effect on the Business Day on which trading in the Units becomes ex-entitlement ("**Rights Issue Adjustment Date**") in accordance with the following formula:

Adjusted Entitlement = Adjustment Component x E

Where:

$$\text{Adjustment Component} = \frac{1 + M}{1 + (R/S) \times M}$$

E: Existing Entitlement immediately prior to the Rights Offer

S: Cum-Rights Unit price being the closing price of an existing Unit as derived from the Daily Quotation Sheet of the Stock Exchange on the last Business Day on which the Units are traded on a Cum-Rights basis

R: Subscription price per new Unit specified in the Rights Offer plus an amount equal to any distributions or other benefits foregone to exercise the Right

M: Number of new Unit(s) (whether a whole or a fraction) per existing Unit each holder thereof is entitled to subscribe

Provided that if the above formula would result in an adjustment to the Entitlement which would amount to one per cent. or less of the Entitlement immediately prior to the adjustment, then no adjustment will be made. In addition, the Issuer shall adjust the Exercise Price (which shall be rounded to the nearest 0.001) by the reciprocal of the Adjustment Component, where the "**reciprocal of the Adjustment Component**" means one divided by the relevant Adjustment Component. The adjustment to the Exercise Price shall take effect on the Rights Issue Adjustment Date.

For the purposes of these Conditions:

"**Rights**" means the right(s) attached to each existing Unit or needed to acquire one new Unit (as the case may be) which are given to the holders of existing Units to subscribe at a fixed subscription price for new Units pursuant to the Rights Offer (whether by the exercise of one Right, a part of a Right or an aggregate number of Rights).

(B) *Bonus Issues.* If and whenever the Trust shall make an issue of Units credited as fully paid to the holders of Units generally (other than pursuant to a scrip distribution or similar scheme for the time being operated by the Trust or otherwise in lieu of a cash distribution and without any payment or other consideration being made or given by such holders) (a "**Bonus Issue**") the Entitlement shall be adjusted to take effect on the Business Day on which trading in the Units becomes ex-entitlement ("**Bonus Issue Adjustment Date**") in accordance with the following formula:

Adjusted Entitlement = Adjustment Component x E

Where:

Adjustment Component = (1 + N)

E: Existing Entitlement immediately prior to the Bonus Issue

N: Number of additional Units (whether a whole or a fraction) received by a holder of Units for each Unit held prior to the Bonus Issue

Provided that if the above formula would result in an adjustment to the Entitlement which would amount to one per cent. or less of the Entitlement immediately prior to the adjustment, then no adjustment will be made. In addition, the Issuer shall adjust the Exercise Price (which shall be rounded to the nearest 0.001) by the reciprocal of the Adjustment Component, where the "**reciprocal of the Adjustment Component**" means one divided by the relevant Adjustment Component. The adjustment to the Exercise Price shall take effect on the Bonus Issue Adjustment Date.

(C) *Subdivisions and Consolidations.* If and whenever the Trust shall subdivide its Units or any class of its outstanding Units into a greater number of units (a "**Subdivision**") or consolidate the Units or any class of its outstanding Units into a smaller number of units (a "**Consolidation**"), then:

(i) in the case of a Subdivision, the Entitlement in effect immediately prior thereto will be increased whereas the Exercise Price (which shall be rounded to the nearest 0.001) will be decreased in the same ratio as the Subdivision; and

(ii) in the case of a Consolidation, the Entitlement in effect immediately prior thereto will be decreased whereas the Exercise Price (which shall be rounded to the nearest 0.001) will be increased in the same ratio as the Consolidation,

in each case on the day on which the Subdivision or Consolidation (as the case may be) shall have taken effect.

(D) *Restructuring Events.* If it is announced that the Trust is to or may merge with or into any other trust or consolidate with or into any other trust or corporation (including becoming, by agreement or otherwise, controlled by any person or corporation) (except where the Trust is the surviving entity in a merger) or that it is to, or may, sell or transfer all or substantially all of its assets, the rights attaching to the Warrants may in the absolute discretion of the Issuer be amended no later than the Business Day preceding the consummation of such merger, consolidation, sale or transfer (each a "**Restructuring Event**") (as determined by the Issuer in its absolute discretion) so that the Warrants shall, after such Restructuring Event, relate to the number of units of the trust(s) resulting from or surviving such Restructuring Event or other securities ("**Substituted Securities**") and/or cash offered in substitution for the affected Units, as the case may be, to which the holder of such number of Units to which the Warrants related immediately before such Restructuring Event would have been entitled upon such Restructuring Event, and thereafter the provisions hereof shall apply to such Substituted Securities, provided that any Substituted Securities may, in the absolute discretion of the Issuer, be deemed to be replaced by an amount in the relevant currency equal to the market value or, if no market value is available, fair value, of such Substituted Securities in each case as determined by the Issuer as soon as practicable after such Restructuring Event is effected. For the avoidance of doubt, any remaining Units shall not be affected by this paragraph and, where cash is offered in substitution for Units or is deemed to replace Substituted Securities as described above, references in these Conditions to the Units shall include any such cash.

(E) *Cash Distribution*. No adjustment will be made for an ordinary cash distribution (whether or not it is offered with a scrip alternative) ("**Ordinary Distribution**"). For any other forms of cash distribution ("**Cash Distribution**") announced by the Trust, such as a cash bonus, special distribution or extraordinary distribution, no adjustment will be made unless the value of the Cash Distribution accounts for 2 per cent. or more of the Unit's closing price on the day of announcement by the Trust.

If and whenever the Trust shall make a Cash Distribution credited as fully paid to the holders of Units generally, the Entitlement shall be adjusted to take effect on the Business Day on which trading in the Units becomes ex-entitlement in respect of the relevant Cash Distribution ("**Distribution Adjustment Date**") in accordance with the following formula:

Adjusted Entitlement = Adjustment Component x E

Where:

$$\text{Adjustment Component} = \frac{S - OD}{S - OD - CD}$$

E: The existing Entitlement immediately prior to the Cash Distribution

S: Cum-Cash Distribution Unit price being the closing price of an existing Unit as derived from the Daily Quotation Sheet of the Stock Exchange on the last Business Day on which the Units are traded on a cum-Cash Distribution basis

CD: The Cash Distribution per Unit

OD: The Ordinary Distribution per Unit, provided that the Ordinary Distribution and the Cash Distribution have the same ex-entitlement date. For avoidance of doubt, the OD shall be zero if the Ordinary Distribution and the Cash Distribution have different ex-entitlement dates

In addition, the Issuer shall adjust the Exercise Price (which shall be rounded to the nearest 0.001) by the reciprocal of the Adjustment Component, where the "**reciprocal of the Adjustment Component**" means one divided by the relevant Adjustment Component. The adjustment to the Exercise Price shall take effect on the Distribution Adjustment Date.

(F) *Other Adjustments*. Without prejudice to and notwithstanding any prior adjustment(s) made pursuant to the applicable Conditions, the Issuer may (but shall not be obliged to) make such other adjustments to the terms and conditions of the Warrants as appropriate where any event (including the events as contemplated in the applicable Conditions) occurs and irrespective of, in substitution for, or in addition to the provisions contemplated in the applicable Conditions, provided that such adjustment is:

(i) not materially prejudicial to the interests of the Warrantholders generally (without considering the circumstances of any individual Warrantholder or the tax or other consequences of such adjustment in any particular jurisdiction); or

(ii) determined by the Issuer in good faith to be appropriate and commercially reasonable.

(G) *Notice of Adjustments*. All determinations made by the Issuer pursuant hereto will be conclusive and binding on the Warrantholders. The Issuer will give, or procure that there is given, notice as soon as practicable of any adjustment and of the date from which such adjustment is effective by publication in accordance with Condition 9.

6. Purchase

The Issuer or any of its subsidiaries may at any time purchase Warrants at any price in the open market or by tender or by private treaty. Any Warrants so purchased may be held or resold or surrendered for cancellation.

7. Global Certificate

A Global Certificate representing the Warrants will be deposited with CCASS in the name of HKSCC Nominees Limited. The Global Certificate must be executed manually on behalf of the Issuer by authorised person(s) or attorney(s) of the Issuer.

8. Meetings of Warrantholders and Modification

(A) *Meetings of Warrantholders.* The Instrument contains provisions for convening meetings of the Warrantholders to consider any matter affecting their interests, including the sanctioning by Extraordinary Resolution (as defined in the Instrument) of a modification of the provisions of the Warrants or of the Instrument.

Any resolution to be passed in a meeting of the Warrantholders shall be decided by poll. A meeting may be convened by the Issuer or by Warrantholders holding not less than 10 per cent. of the Warrants for the time being remaining unexercised. The quorum at any such meeting for passing an Extraordinary Resolution will be two or more persons holding or representing not less than 25 per cent. of the Warrants for the time being remaining unexercised, or at any adjourned meeting two or more persons being or representing Warrantholders whatever the number of Warrants so held or represented.

A resolution will be an Extraordinary Resolution when it has been passed at a duly convened meeting by not less than three-quarters of the votes cast by such Warrantholders who, being entitled to do so, vote in person or by proxy.

An Extraordinary Resolution passed at any meeting of the Warrantholders shall be binding on all the Warrantholders, whether or not they are present at the meeting.

Resolutions can be passed in writing without a meeting of the Warrantholders being held if passed unanimously.

(B) *Modification.* The Issuer may, without the consent of the Warrantholders, effect any modification of the terms and conditions of the Warrants or the Instrument which, in the opinion of the Issuer, is (i) not materially prejudicial to the interests of the Warrantholders generally (without considering the circumstances of any individual Warrantholder or the tax or other consequences of such modification in any particular jurisdiction); (ii) of a formal, minor or technical nature; (iii) made to correct a manifest error; or (iv) necessary in order to comply with mandatory provisions of the laws or regulations of Hong Kong. Any such modification shall be binding on the Warrantholders and shall be notified to them by the Issuer as soon as practicable thereafter in accordance with Condition 9.

9. Notices

All notices to the Warrantholders will be validly given if published in English and in Chinese on the HKEX website. In such circumstances, the Issuer shall not be required to despatch copies of the notice to the Warrantholders.

10. Termination or Liquidation

In the event of a Termination or the liquidation or dissolution of the trustee of the Trust (including any successor trustee appointed from time to time) ("**Trustee**") (in its capacity as trustee of the Trust) or the appointment of a liquidator, receiver or administrator or analogous person under any applicable law in respect of the whole or substantially the whole of the Trustee's undertaking, property or assets, all unexercised Warrants will lapse and shall cease to be valid for any purpose. In the case of a Termination, the unexercised Warrants will lapse and shall cease to be valid on the effective date of the Termination, in the case of a voluntary liquidation, the unexercised Warrants will lapse and shall cease to be valid on the effective date of the relevant resolution and, in the case of an involuntary liquidation or dissolution, on the date of the relevant court order or, in the case of the appointment of a liquidator or receiver or administrator or analogous person under any applicable law in respect of the whole or substantially the whole of the Trustee's undertaking, property or assets, on the date when such appointment is effective but subject (in any such case) to any contrary mandatory requirement of law.

For the purpose of this Condition 10, "**Termination**" means (i) the Trust is terminated, or the Trustee or the manager of the Trust (including any successor manager appointed from time to time) ("**Manager**") is required to terminate the Trust under the trust deed ("**Trust Deed**") constituting the Trust or applicable law, or the termination of the Trust commences; (ii) the Trust is held or is conceded by the Trustee or the Manager not to have been constituted or to have been imperfectly constituted; (iii) the Trustee ceases to be authorised under the Trust to hold the property of the Trust in its name and perform its obligations under the Trust Deed; or (iv) the Trust ceases to be authorised as an authorised collective investment scheme under the Securities and Futures Ordinance (Cap. 571 of the Laws of Hong Kong).

11. Further Issues

The Issuer shall be at liberty from time to time, without the consent of the Warrantholders, to create and issue further warrants so as to form a single series with the Warrants.

12. Delisting

(A) If at any time the Units cease to be listed on the Stock Exchange, the Issuer shall give effect to these Conditions in such manner and make such adjustments and amendments to the rights attaching to the Warrants as it shall, in its absolute discretion, consider appropriate to ensure, so far as it is reasonably able to do so, that the interests of the Warrantholders generally are not materially prejudiced as a consequence of such delisting (without considering the circumstances of any individual Warrantholder or the tax or other consequences that may result in any particular jurisdiction).

(B) Without prejudice to the generality of Condition 12(A), where the Units are, or, upon the delisting, become, listed on any other stock exchange, these Conditions may, in the absolute discretion of the Issuer, be amended to the extent necessary to allow for the substitution of that other stock exchange in place of the Stock Exchange and the Issuer may, without the consent of the Warrantholders, make such adjustments to the entitlements of the Warrantholders on exercise (including, if appropriate, by converting foreign currency amounts at prevailing market rates into the relevant currency) as may be appropriate in the circumstances.

(C) The Issuer shall determine, in its absolute discretion, any adjustment or amendment and its determination shall be conclusive and binding on the Warrantholders save in the case of manifest error. Notice of any adjustments or amendments shall be given to the Warrantholders in accordance with Condition 9 as soon as practicable after they are determined.

13. Illegality or Impracticability

The Issuer is entitled to terminate the Warrants if it determines in good faith and in a commercially reasonable manner that, for reasons beyond its control, it has become or it will become illegal or impracticable:

(i) for it to perform its obligations under the Warrants in whole or in part as a result of:

(a) the adoption of, or any change in, any relevant law or regulation (including any tax law); or

(b) the promulgation of, or any change in, the interpretation by any court, tribunal, governmental, administrative, legislative, regulatory or judicial authority or power with competent jurisdiction of any relevant law or regulation (including any tax law),

(each of (a) and (b), a "**Change in Law Event**"); or

(ii) for it or any of its affiliates to maintain the Issuer's hedging arrangements with respect to the Warrants due to a Change in Law Event.

Upon the occurrence of a Change in Law Event, the Issuer will, if and to the extent permitted by the applicable law or regulation, pay to each Warrantholder a cash amount that the Issuer determines in good faith and in a commercially reasonable manner to be the fair market value in respect of each Warrant held by such Warrantholder immediately prior to such termination (ignoring such illegality or impracticability) less the cost to the Issuer of unwinding any related hedging arrangement as determined by the Issuer in its sole and absolute discretion. Payment will be made to each Warrantholder in such manner as shall be notified to the Warrantholder in accordance with Condition 9.

14. Good Faith and Commercially Reasonable Manner

Any exercise of discretion by the Issuer under these Conditions will be made in good faith and in a commercially reasonable manner.

15. Governing Law

The Warrants and the Instrument are governed by and construed in accordance with the laws of the Hong Kong Special Administrative Region of the People's Republic of China ("**Hong Kong**"). The Issuer and each Warrantholder (by its purchase of the Warrants) submit for all purposes in connection with the Warrants and the Instrument to the non-exclusive jurisdiction of the courts of Hong Kong.

16. Contracts (Rights of Third Parties) Ordinance

A person who is not a party to these Conditions has no right under the Contracts (Rights of Third Parties) Ordinance (Cap. 623 of the Laws of Hong Kong) to enforce or to enjoy the benefit of any term of the Warrants.

17. Language

A Chinese translation of these Conditions will be made available for collection during normal office hours from the Sponsor at 52nd Floor, Two International Finance Centre, 8 Finance Street, Central, Hong Kong. In the event of any inconsistency between the Chinese translation and the English version of these Conditions, the English version of these Conditions shall prevail.

18. Prescription

Claims against the Issuer for payment of any amount in respect of the Warrants will become void unless made within ten years of the Expiry Date and thereafter, any sums payable in respect of such Warrants shall be forfeited and shall revert to the Issuer.

Sponsor:
UBS Securities Asia Limited
52nd Floor
Two International Finance Centre
8 Finance Street, Central
Hong Kong

APPENDIX 2 — TERMS AND CONDITIONS OF CBBCs

The following pages set out the Conditions in respect of different types of CBBCs.

PART A — TERMS AND CONDITIONS OF CASH SETTLED CALLABLE BULL/BEAR CONTRACTS OVER SINGLE EQUITIES

These Conditions will, together with the supplemental provisions contained in the relevant Launch Announcement and Supplemental Listing Document, and subject to completion and amendment, be endorsed on the Global Certificate. The relevant Launch Announcement and Supplemental Listing Document in relation to the issue of any series of CBBCs may specify other terms and conditions which shall, to the extent so specified or to the extent they are inconsistent with these Conditions, replace or modify these Conditions for the purpose of such series of CBBCs.

1. Form, Status, Transfer, Title and Additional Costs and Expenses

(A) The CBBCs (which expression shall, unless the context otherwise requires, include any further CBBCs issued pursuant to Condition 12) relating to the Shares of the Company are issued in registered form subject to and with the benefit of an instrument by way of deed poll (the "**Instrument**" as defined more fully in the relevant Launch Announcement and Supplemental Listing Document) executed by UBS AG (the "**Issuer**") acting through its London branch or any of its branches outside Switzerland as it may specify from time to time. The Holders (as defined below) are entitled to the benefit of, are bound by, and are deemed to have notice of all the provisions of the Instrument. A copy of the Instrument is available for inspection at the offices of UBS Securities Asia Limited ("**Sponsor**") at 52nd Floor, Two International Finance Centre, 8 Finance Street, Central, Hong Kong.

The CBBCs are represented by a global certificate ("**Global Certificate**") registered in the name of HKSCC Nominees Limited (or such other nominee company as may be used by Hong Kong Securities Clearing Company Limited ("**HKSCC**") from time to time in relation to the provision of nominee services to persons admitted for the time being by HKSCC as a participant of CCASS) (the "**Nominee**"). No definitive certificate will be issued. The CBBCs can only be exercised by HKSCC or the Nominee.

(B) The settlement obligation of the Issuer in respect of the CBBCs represents general unsecured contractual obligations of the Issuer and of no other person which rank, and will rank, equally among themselves and pari passu with all other present and future unsecured and unsubordinated contractual obligations of the Issuer, except for obligations accorded preference by mandatory provisions of applicable law.

CBBCs represent general contractual obligations of the Issuer, and are not, nor is it the intention (expressed, implicit or otherwise) of the Issuer to create by the issue of CBBCs deposit liabilities of the Issuer or a debt obligation of any kind.

(C) Transfers of CBBCs may be effected only in Board Lots or integral multiples thereof in CCASS in accordance with the General Rules of CCASS and the CCASS Operational Procedures in effect from time to time (the "**CCASS Rules**").

(D) Each person who is for the time being shown in the register kept by the Issuer in Hong Kong as the holder shall be treated by the Issuer and the Sponsor as the absolute owner and holder of the CBBCs. The expressions "**Holder**" and "**Holders**" shall be construed accordingly.

(E) Holders are responsible for additional costs and expenses in connection with any exercise of the CBBCs including the Exercise Expenses (as defined below) which amount shall, subject to Condition 4(G) and to the extent necessary, be payable to the Issuer and collected from the Holders.

2. Definitions

For the purposes of these Conditions:

"**Board Lot**" has the meaning given to it in the relevant Launch Announcement and Supplemental Listing Document;

"**Business Day**" means a day (excluding Saturdays) on which the Stock Exchange is scheduled to open for dealings in Hong Kong and banks are open for business in Hong Kong;

"**Call Price**" means the price specified as such in the relevant Launch Announcement and Supplemental Listing Document, subject to any adjustment in accordance with Condition 6;

"**Cash Settlement Amount**" means, for every Board Lot, an amount in the Settlement Currency calculated by the Issuer in accordance with the following formula:

(i) following a Mandatory Call Event:

(a) in the case of a series of Category R CBBCs, the Residual Value; or

(b) in the case of a series of Category N CBBCs, zero.

(ii) at expiry:

(a) in the case of a series of bull CBBCs:

$$\text{Cash Settlement Amount per Board Lot} = \frac{\text{Entitlement x (Closing Price - Strike Price) x one Board Lot}}{\text{Number of CBBC(s) per Entitlement}}$$

(b) in the case of a series of bear CBBCs:

$$\text{Cash Settlement Amount per Board Lot} = \frac{\text{Entitlement x (Strike Price - Closing Price) x one Board Lot}}{\text{Number of CBBC(s) per Entitlement}}$$

For the avoidance of doubt, if the Cash Settlement Amount is a negative figure, it shall be deemed to be zero;

"**Category N CBBCs**" means a series of CBBCs where the Call Price is equal to the Strike Price;

"**Category R CBBCs**" means a series of CBBCs where the Call Price is different from the Strike Price;

"**CCASS**" means the Central Clearing and Settlement System;

"**CCASS Settlement Day**" has the meaning ascribed to the term "Settlement Day" in the CCASS Rules, subject to such modification and amendment prescribed by HKSCC from time to time;

"**Closing Price**" means the closing price of one Share (as derived from the Daily Quotation Sheet of the Stock Exchange, subject to any adjustment to such closing price as may be necessary to reflect any event as contemplated in Condition 6 such as capitalisation, rights issue, distribution or the like) on the Valuation Date;

"**Company**" means the company specified as such in the relevant Launch Announcement and Supplemental Listing Document;

"**Entitlement**" means the number specified as such in the relevant Launch Announcement and Supplemental Listing Document, subject to any adjustment in accordance with Condition 6;

"**Exercise Expenses**" means any charges or expenses including any taxes or duties which are incurred in respect of the exercise of a Board Lot of CBBCs;

"**Expiry Date**" means the date specified as such in the relevant Launch Announcement and Supplemental Listing Document;

"**Listing Date**" means the date specified as such in the relevant Launch Announcement and Supplemental Listing Document;

"**Mandatory Call Event**" occurs when the Spot Price of the Shares on any Trading Day during the Observation Period is:

(i) in the case of a series of bull CBBCs, at or below the Call Price; or

(ii) in the case of a series of bear CBBCs, at or above the Call Price;

"**Market Disruption Event**" means:

(1) the occurrence or existence on any Trading Day during the one-half hour period that ends at the close of trading of any suspension of or limitation imposed on trading (by reason of movements in price exceeding limits permitted by the Stock Exchange or otherwise) on the Stock Exchange in (a) the Shares; or (b) any options or futures contracts relating to the Shares if, in any such case, such suspension or limitation is, in the determination of the Issuer, material;

(2) the issuance of the tropical cyclone warning signal number 8 or above or the issuance of a "BLACK" rainstorm signal on any day which either (i) results in the Stock Exchange being closed for trading for the entire day; or (ii) results in the Stock Exchange being closed prior to its regular time for close of trading for the relevant day (for the avoidance of doubt, in the case when the Stock Exchange is scheduled to open for the morning trading session only, closed prior to its regular time for close of trading for the morning session), PROVIDED THAT there shall be no Market Disruption Event solely by reason of the Stock Exchange opening for trading later than its regular time for opening of trading on any day as a result of the tropical cyclone warning signal number 8 or above or the "BLACK" rainstorm signal having been issued; or

(3) a limitation or closure of the Stock Exchange due to any unforeseen circumstances;

"**Maximum Trade Price**" means the highest Spot Price of the Shares (subject to any adjustment to such Spot Price as may be necessary to reflect any event as contemplated in Condition 6 such as capitalisation, rights issue, distribution or the like) during the MCE Valuation Period;

"**MCE Valuation Period**" means the period commencing from and including the moment upon which the Mandatory Call Event occurs (the trading session during which the Mandatory Call Event occurs is the "**1st Session**") and up to the end of the trading session on the Stock Exchange immediately following the 1st Session ("**2nd Session**") unless, in the determination of the Issuer in its good faith, the 2nd Session for any reason (including, without limitation, a Market Disruption Event occurring and subsisting in the 2nd Session) does not contain any continuous period of 1 hour or more than 1 hour during which trading in the Shares is permitted on the Stock Exchange with no limitation imposed, the MCE Valuation Period shall be extended to the end of the subsequent trading session following the 2nd Session during which trading in the Shares is permitted on the Stock Exchange with no limitation imposed for a continuous period of at least 1 hour notwithstanding the existence or continuance of a Market Disruption Event in such postponed trading session, unless the Issuer determines in its good faith that each trading session on each of the four Trading Days immediately following the date on which the Mandatory Call

Event occurs does not contain any continuous period of 1 hour or more than 1 hour during which trading in the Shares is permitted on the Stock Exchange with no limitation imposed. In that case:

(i) the period commencing from the 1st Session up to, and including, the last trading session on the Stock Exchange of the fourth Trading Day immediately following the date on which the Mandatory Call Event occurs shall be deemed to be the MCE Valuation Period; and

(ii) the Issuer shall determine the Maximum Trade Price or the Minimum Trade Price (as the case may be) having regard to the then prevailing market conditions, the last reported Spot Price and such other factors as the Issuer may determine to be relevant in its good faith.

For the avoidance of doubt, all Spot Prices available throughout the extended MCE Valuation Period shall be taken into account to determine the Maximum Trade Price or the Minimum Trade Price (as the case may be) for the calculation of the Residual Value.

For the purposes of this definition,

(a) the pre-opening session, the morning session and, in the case of half day trading, the closing auction session (if any) of the same day; and

(b) the afternoon session and the closing auction session (if any) of the same day,

shall each be considered as one trading session only;

"**Minimum Trade Price**" means the lowest Spot Price of the Shares (subject to any adjustment to such Spot Price as may be necessary to reflect any event as contemplated in Condition 6 such as capitalisation, rights issue, distribution or the like) during the MCE Valuation Period;

"**Observation Commencement Date**" means the date specified as such in the relevant Launch Announcement and Supplemental Listing Document;

"**Observation Period**" means the period commencing from and including the Observation Commencement Date and ending on and including the Trading Day immediately preceding the Expiry Date;

"**Post MCE Trades**" has the meaning given to it in the relevant Launch Announcement and Supplemental Listing Document, subject to such modification and amendment prescribed by the Stock Exchange from time to time;

"**Residual Value**" means, for every Board Lot, an amount in the Settlement Currency calculated by the Issuer in accordance with the following formula:

(i) in the case of a series of bull CBBCs:

$$\text{Residual Value per Board Lot} = \frac{\text{Entitlement x (Minimum Trade Price - Strike Price) x one Board Lot}}{\text{Number of CBBC(s) per Entitlement}}$$

(ii) in the case of a series of bear CBBCs:

$$\text{Residual Value per Board Lot} = \frac{\text{Entitlement x (Strike Price - Maximum Trade Price) x one Board Lot}}{\text{Number of CBBC(s) per Entitlement}}$$

"**Settlement Currency**" means the currency specified as such in the relevant Launch Announcement and Supplemental Listing Document;

"**Settlement Date**" means the third CCASS Settlement Day after (i) the end of the MCE Valuation Period or (ii) the later of: (a) the Expiry Date; and (b) the day on which the Closing Price is determined in accordance with the Conditions (as the case may be);

"**Share**" means the share specified as such in the relevant Launch Announcement and Supplemental Listing Document;

"**Spot Price**" means:

(a) in respect of a continuous trading session of the Stock Exchange, the price per Share concluded by means of automatic order matching on the Stock Exchange as reported in the official real-time dissemination mechanism for the Stock Exchange during such continuous trading session in accordance with the Trading Rules, excluding direct business (as defined in the Trading Rules); and

(b) in respect of a pre-opening session or a closing auction session (if applicable) of the Stock Exchange, as the case may be, the final Indicative Equilibrium Price (as defined in the Trading Rules) of the Share (if any) calculated at the end of the pre-order matching period of such pre-opening session or closing auction session (if applicable), as the case may be, in accordance with the Trading Rules, excluding direct business (as defined in the Trading Rules),

subject to such modification and amendment prescribed by the Stock Exchange from time to time;

"**Stock Exchange**" means The Stock Exchange of Hong Kong Limited;

"**Strike Price**" means the price specified as such in the relevant Launch Announcement and Supplemental Listing Document, subject to any adjustment in accordance with Condition 6;

"**Trading Day**" means any day on which the Stock Exchange is scheduled to open for trading for its regular trading sessions;

"**Trading Rules**" means the Rules and Regulations of the Exchange prescribed by the Stock Exchange from time to time; and

"**Valuation Date**" means the Trading Day immediately preceding the Expiry Date unless, in the determination of the Issuer, a Market Disruption Event has occurred on that day in which case, the Valuation Date shall be the first succeeding Trading Day on which the Issuer determines that there is no Market Disruption Event, unless the Issuer determines that there is a Market Disruption Event occurring on each of the four Trading Days immediately following the original date which (but for the Market Disruption Event) would have been the Valuation Date. In that case:

(a) the fourth Trading Day immediately following the original date shall be deemed to be the Valuation Date (regardless of the Market Disruption Event); and

(b) the Issuer shall determine the Closing Price having regard to the then prevailing market conditions, the last reported trading price of the Share on the Stock Exchange and such other factors as the Issuer determines to be relevant.

Other capitalized terms shall, unless otherwise defined herein, have the meaning ascribed to them in the Base Listing Document, any addendum to the Base Listing Document, the relevant Launch Announcement and Supplemental Listing Document or the Global Certificate.

3. Hedging Disruption and Illegality or Impracticability

(A) Hedging Disruption

(i) *Notification.* The Issuer shall as soon as reasonably practicable give notice to the Holders in accordance with Condition 10:

(1) if it determines that a Hedging Disruption Event has occurred; and

(2) of the consequence of such Hedging Disruption Event as determined by the Issuer pursuant to Condition 3(A)(iii).

(ii) *Hedging Disruption Event.* A "**Hedging Disruption Event**" occurs if the Issuer determines in good faith and in a commercially reasonable manner that it is or has become not reasonably practicable or it has otherwise become undesirable, for any reason, for the Issuer wholly or partially to establish, re-establish, substitute or maintain a relevant hedging transaction (a "**Relevant Hedging Transaction**") it deems necessary or desirable to hedge the Issuer's obligations in respect of the CBBCs. The reasons for such determination by the Issuer may include, but are not limited to, the following:

(1) any material illiquidity in the market for the Shares;

(2) a change in any applicable law (including, without limitation, any tax law) or the promulgation of, or change in, the interpretation of any court, tribunal or regulatory authority with competent jurisdiction of any applicable law (including any action taken by a taxing authority);

(3) a material decline in the creditworthiness of a party with whom the Issuer has entered into any such Relevant Hedging Transaction; or

(4) the general unavailability of:

(A) market participants who will agree to enter into a Relevant Hedging Transaction; or

(B) market participants who will so enter into a Relevant Hedging Transaction on commercially reasonable terms.

(iii) *Consequences.* The Issuer, in the event of a Hedging Disruption Event, may determine to:

(1) terminate the CBBCs. In such circumstances the Issuer will, however, if and to the extent permitted by the applicable law, pay to each Holder in respect of each CBBC held by such Holder an amount that the Issuer determines in good faith and in a commercially reasonable manner to be the fair market value of the CBBC immediately prior to such termination less the cost to the Issuer of unwinding any related hedging arrangements. Payment will be made to the Holder in such manner as shall be notified to the Holder in accordance with Condition 10; or

(2) make any other adjustment to the Conditions as it considers appropriate in order to maintain the theoretical value of the CBBCs after adjusting for the relevant Hedging Disruption Event.

(B) Illegality or Impracticability

The Issuer is entitled to terminate the CBBCs if it determines in good faith and in a commercially reasonable manner that, for reasons beyond its control, it has become or it will become illegal or impracticable:

(i) for it to perform its obligations under the CBBCs in whole or in part as a result of:

(1) the adoption of, or any change in, any relevant law or regulation (including any tax law); or

(2) the promulgation of, or any change in, the interpretation by any court, tribunal, governmental, administrative, legislative, regulatory or judicial authority or power with competent jurisdiction of any relevant law or regulation (including any tax law),

(each of (1) and (2), a "**Change in Law Event**"); or

(ii) for it or any of its affiliates to maintain the Issuer's hedging arrangements with respect to the CBBCs due to a Change in Law Event.

Upon the occurrence of a Change in Law Event, the Issuer will, if and to the extent permitted by the applicable law or regulation, pay to each Holder a cash amount that the Issuer determines in good faith and in a commercially reasonable manner to be the fair market value in respect of each CBBC held by such Holder immediately prior to such termination (ignoring such illegality or impracticability) less the cost to the Issuer of unwinding any related hedging arrangement as determined by the Issuer in its sole and absolute discretion. Payment will be made to each Holder in such manner as shall be notified to the Holder in accordance with Condition 10.

4. EXERCISE OF CBBCS

(A) CBBCs may only be exercised in Board Lots or integral multiples thereof.

(B) If no Mandatory Call Event has occurred during the Observation Period, the CBBCs will be deemed to be automatically exercised on the Expiry Date.

(C) Mandatory Call Event

(i) Subject to paragraph (ii) below, following a Mandatory Call Event, the CBBCs will terminate automatically and the Issuer shall have no further obligation under the CBBCs except for the payment of the Cash Settlement Amount (if any) following the Mandatory Call Event on the relevant Settlement Date. The Issuer will give notice to the Holders in accordance with Condition 10. Trading in the CBBCs will be suspended immediately upon the occurrence of a Mandatory Call Event and all Post MCE Trades will be cancelled and will not be recognised by the Issuer or the Stock Exchange.

Revocation

(ii) A Mandatory Call Event is irrevocable unless it is triggered as a result of any of the following events:

(1) system malfunction or other technical errors of Hong Kong Exchanges and Clearing Limited ("**HKEX**") (such as the setting up of wrong Call Price and other parameters); or

(2) manifest errors caused by the relevant third party price source where applicable;

and

(A) in the case of a system malfunction or other technical errors prescribed in paragraph (1) above, such event is reported by the Stock Exchange to the Issuer and the Issuer and the Stock Exchange mutually agree that such Mandatory Call Event is to be revoked; and

(B) in the case of an error by the relevant price source prescribed in paragraph (2) above, such event is reported by the Issuer to the Stock Exchange and the Issuer and the Stock Exchange mutually agree that such Mandatory Call Event is to be revoked,

in each case, such mutual agreement must be reached no later than 30 minutes before the commencement of trading (including the pre-opening session) (Hong Kong time) on the Trading Day of the Stock Exchange immediately following the day on which the Mandatory Call Event occurs or such other time frame as prescribed by the Stock Exchange from time to time.

(D) Every Board Lot of CBBCs entitles the Holder to receive from the Issuer on the Settlement Date the Cash Settlement Amount (if any).

(E) Any Exercise Expenses which are not determined by the Issuer by the Business Day after the MCE Valuation Period or the Expiry Date (as the case may be) and deducted from the Cash Settlement Amount prior to delivery to the Holders in accordance with this Condition 4, shall be notified by the Issuer to the Holders as soon as practicable after determination thereof and shall be paid by the Holders to the Issuer immediately upon demand.

(F) In the event that the CBBCs have been exercised or have expired worthless, the Issuer will, with effect from the first Business Day following the MCE Valuation Period or the Expiry Date, as the case may be, remove the name of each Holder from the register of Holders in respect of such CBBCs and thereby cancel the relevant CBBCs and, if applicable, cancel the Global Certificate.

(G) Upon exercise following a Mandatory Call Event or on the Expiry Date in accordance with these Conditions, the Issuer will pay the Cash Settlement Amount minus the determined Exercise Expenses to the relevant Holder. If the Cash Settlement Amount is equal to or less than the determined Exercise Expenses, no amount is payable.

The aggregate Cash Settlement Amount minus the determined aggregate Exercise Expenses shall be despatched no later than the Settlement Date, by crediting that amount, in accordance with the CCASS Rules, to the relevant bank account designated by each Holder (the "**Designated Bank Account**").

If as a result of an event beyond the control of the Issuer ("**Settlement Disruption Event**"), it is not possible for the Issuer to procure payment electronically through CCASS by crediting the relevant Designated Bank Account of the Holder on the original Settlement Date, the Issuer shall use its reasonable endeavours to procure payment electronically through CCASS by crediting the relevant Designated Bank Account of the Holder as soon as reasonably practicable after the original Settlement Date. The Issuer will not be liable to the Holder for any interest in respect of the amount due or any loss or damage that such Holder may suffer as a result of the existence of a Settlement Disruption Event.

(H) None of the Issuer, the Sponsor or their respective agents shall have any responsibility for any errors or omissions in the calculation and dissemination of any variables published by a third party and used in any calculation made pursuant to these Conditions or in the calculation of the Cash Settlement Amount arising from such errors or omissions.

The purchase of CBBCs does not confer on any Holder of such CBBCs any rights (whether in respect of voting, distributions or otherwise) in relation to the Shares.

(I) Exercise and settlement of the CBBCs is subject to all applicable laws, rules, regulations and guidelines in force at the relevant time and neither the Issuer nor the Sponsor shall incur any liability whatsoever if it is unable to effect the transactions contemplated, after using all reasonable efforts, as a result of any such laws, rules, regulations or guidelines. Neither the Issuer nor the Sponsor shall under any circumstances be liable for any acts or defaults of the CCASS in relation to the performance of its duties in relation to the CBBCs.

(J) Subject to Condition 4(C)(ii), trading in CBBCs on the Stock Exchange shall cease (i) immediately upon the occurrence of a Mandatory Call Event or (ii) at the close of trading for the Trading Day immediately preceding the Expiry Date (for the avoidance of doubt, in the case when the Stock Exchange is scheduled to open for the morning session only, at the close of trading for the morning session), whichever is the earlier. All Post MCE Trades will be invalid and will be cancelled, and will not be recognised by the Issuer or the Stock Exchange.

5. Sponsor

(A) The Sponsor will not assume any obligation or duty to or any relationship or agency or trust for the Holders.

(B) The Issuer reserves the right, subject to the appointment of a successor, at any time to vary or terminate the appointment of the initial Sponsor and to appoint another sponsor provided that it will at all times maintain a sponsor in Hong Kong for so long as the CBBCs are listed on the Stock Exchange. Notice of any such termination or appointment will be given to the Holders in accordance with Condition 10.

6. Adjustments

(A) *Rights Issues.* If and whenever the Company shall, by way of Rights (as defined below), offer new Shares for subscription at a fixed subscription price to the holders of existing Shares pro rata to existing holdings (a "**Rights Offer**"), the Entitlement shall be adjusted to take effect on the Business Day on which trading in the Shares becomes ex-entitlement ("**Rights Issue Adjustment Date**") in accordance with the following formula:

Adjusted Entitlement = Adjustment Component x E

Where:

$$\text{Adjustment Component} = \frac{1 + M}{1 + (R/S) \times M}$$

E: Existing Entitlement immediately prior to the Rights Offer

S: Cum-Rights Share price being the closing price of an existing Share as derived from the Daily Quotation Sheet of the Stock Exchange on the last Business Day on which the Shares are traded on a Cum-Rights basis

R: Subscription price per new Share specified in the Rights Offer plus an amount equal to any dividends or other benefits foregone to exercise the Right

M: Number of new Share(s) (whether a whole or a fraction) per existing Share each holder thereof is entitled to subscribe

Provided that if the above formula would result in an adjustment to the Entitlement which would amount to one per cent. or less of the Entitlement immediately prior to the adjustment, then no adjustment will be made. In addition, the Issuer shall adjust the Strike Price and/or the Call Price (which shall be rounded to the nearest 0.001) by the reciprocal of the Adjustment Component, where the "**reciprocal of the Adjustment Component**" means one divided by the relevant Adjustment Component. The adjustment to the Strike Price and/or the Call Price shall take effect on the Rights Issue Adjustment Date.

For the purposes of these Conditions:

"**Rights**" means the right(s) attached to each existing Share or needed to acquire one new Share (as the case may be) which are given to the holders of existing Shares to subscribe at a fixed subscription price for new Shares pursuant to the Rights Offer (whether by the exercise of one Right, a part of a Right or an aggregate number of Rights).

(B) *Bonus Issues.* If and whenever the Company shall make an issue of Shares credited as fully paid to the holders of Shares generally by way of capitalisation of profits or reserves (other than pursuant to a scrip dividend or similar scheme for the time being operated by the Company or otherwise in lieu of a cash dividend and without any payment or other consideration being made or given by such holders) (a "**Bonus Issue**") the Entitlement shall be adjusted to take effect on the Business Day on which trading in the Shares becomes ex-entitlement ("**Bonus Issue Adjustment Date**") in accordance with the following formula:

Adjusted Entitlement = Adjustment Component x E

Where:

Adjustment Component = (1 + N)

E: Existing Entitlement immediately prior to the Bonus Issue

N: Number of additional Shares (whether a whole or a fraction) received by a holder of Shares for each Share held prior to the Bonus Issue

Provided that if the above formula would result in an adjustment to the Entitlement which would amount to one per cent. or less of the Entitlement immediately prior to the adjustment, then no adjustment will be made. In addition, the Issuer shall adjust the Strike Price and/or the Call Price (which shall be rounded to the nearest 0.001) by the reciprocal of the Adjustment Component, where the "**reciprocal of the Adjustment Component**" means one divided by the relevant Adjustment Component. The adjustment to the Strike Price and/or the Call Price shall take effect on the Bonus Issue Adjustment Date.

(C) *Subdivisions and Consolidations.* If and whenever the Company shall subdivide its Shares or any class of its outstanding share capital comprised of the Shares into a greater number of shares (a "**Subdivision**") or consolidate the Shares or any class of its outstanding share capital comprised of the Shares into a smaller number of shares (a "**Consolidation**"), then:

(i) in the case of a Subdivision, the Entitlement in effect immediately prior thereto will be increased whereas the Strike Price and/or the Call Price (which shall be rounded to the nearest 0.001) will be decreased in the same ratio as the Subdivision; and

(ii) in the case of a Consolidation, the Entitlement in effect immediately prior thereto will be decreased whereas the Strike Price and/or the Call Price (which shall be rounded to the nearest 0.001) will be increased in the same ratio as the Consolidation, in each case on the day on which the Subdivision or Consolidation (as the case may be) shall have taken effect.

(D) *Restructuring Events.* If it is announced that the Company is to or may merge or consolidate with or into any other corporation (including becoming, by agreement or otherwise, a subsidiary of or controlled by any person or corporation) (except where the Company is the surviving corporation in a merger) or that it is to or may sell or transfer all or substantially all of its assets, the rights attaching to the CBBCs may in the absolute discretion of the Issuer be amended no later than the Business Day preceding the consummation of such merger, consolidation, sale or transfer (each a "**Restructuring Event**") (as determined by the Issuer in its absolute discretion) so that the CBBCs shall, after such Restructuring Event, relate to the number of shares of the corporation(s) resulting from or surviving such Restructuring Event or other securities ("**Substituted Securities**") and/or cash offered in substitution for the affected Shares, as the case may be, to which the holder of such number of Shares to which the CBBCs related immediately before such Restructuring Event would have been entitled upon such Restructuring Event, and thereafter the provisions hereof shall apply to such Substituted Securities, provided that any Substituted Securities may, in the absolute discretion of the Issuer, be deemed to be replaced by an amount in the relevant currency equal to the market value or, if no market value is available, fair value, of such Substituted Securities in each case as determined by the Issuer as soon as practicable after such Restructuring Event is effected. For the avoidance of doubt, any remaining Shares shall not be affected by this paragraph and, where cash is offered in substitution for Shares or is deemed to replace Substituted Securities as described above, references in these Conditions to the Shares shall include any such cash.

(E) *Cash Distribution.* No adjustment will be made for an ordinary cash dividend (whether or not it is offered with a scrip alternative) ("**Ordinary Dividend**"). For any other forms of cash distribution ("**Cash Distribution**") announced by the Company, such as a cash bonus, special dividend or extraordinary dividend, no adjustment will be made unless the value of the Cash Distribution accounts for 2 per cent. or more of the Share's closing price on the day of announcement by the Company.

If and whenever the Company shall make a Cash Distribution credited as fully paid to the holders of Shares generally, the Entitlement shall be adjusted to take effect on the Business Day on which trading in the Shares becomes ex-entitlement in respect of the Cash Distribution ("**Distribution Adjustment Date**") in accordance with the following formula:

Adjusted Entitlement = Adjustment Component x E

Where:

$$\text{Adjustment Component} = \frac{S - OD}{S - OD - CD}$$

E: The existing Entitlement immediately prior to the Cash Distribution

S: Cum-Cash Distribution Share price being the closing price of an existing Share as derived from the Daily Quotation Sheet of the Stock Exchange on the last Business Day on which the Shares are traded on a cum-Cash Distribution basis

CD: The Cash Distribution per Share

OD: The Ordinary Dividend per Share, provided that the Ordinary Dividend and the Cash Distribution have the same ex-entitlement date. For avoidance of doubt, the OD shall be zero if the Ordinary Dividend and the Cash Distribution have different ex-entitlement dates

In addition, the Issuer shall adjust the Strike Price and/or the Call Price (which shall be rounded to the nearest 0.001) by the reciprocal of the Adjustment Component, where the "**reciprocal of the Adjustment Component**" means one divided by the relevant Adjustment Component. The adjustment to the Strike Price and/or the Call Price shall take effect on the Distribution Adjustment Date.

(F) *Other Adjustments.* Without prejudice to and notwithstanding any prior adjustment(s) made pursuant to the applicable Conditions, the Issuer may (but shall not be obliged to) make such other adjustments to the terms and conditions of the CBBCs as appropriate where any event (including the events as contemplated in the applicable Conditions) occurs and irrespective of, in substitution for, or in addition to the provisions contemplated in the applicable Conditions, provided that such adjustment is:

(i) not materially prejudicial to the interests of the Holders generally (without considering the circumstances of any individual Holder or the tax or other consequences of such adjustment in any particular jurisdiction); or

(ii) determined by the Issuer in good faith to be appropriate and commercially reasonable.

(G) *Notice of Adjustments.* All determinations made by the Issuer pursuant hereto will be conclusive and binding on the Holders. The Issuer will give, or procure that there is given, notice as soon as practicable of any adjustment and of the date from which such adjustment is effective by publication in accordance with Condition 10.

7. Purchase

The Issuer or any of its subsidiaries may at any time purchase CBBCs at any price in the open market or by tender or by private treaty. Any CBBCs so purchased may be held or resold or surrendered for cancellation.

8. Global Certificate

A Global Certificate representing the CBBCs will be deposited with CCASS in the name of HKSCC Nominees Limited. The Global Certificate must be executed manually on behalf of the Issuer by authorised person(s) or attorney(s) of the Issuer.

9. Meetings of Holders and Modification

(A) *Meetings of Holders.* The Instrument contains provisions for convening meetings of the Holders to consider any matter affecting their interests, including the sanctioning by Extraordinary Resolution (as defined in the Instrument) of a modification of the provisions of the CBBCs or of the Instrument.

Any resolution to be passed in a meeting of the Holders shall be decided by poll. A meeting may be convened by the Issuer or by Holders holding not less than 10 per cent. of the CBBCs for the time being remaining unexercised. The quorum at any such meeting for passing an Extraordinary Resolution will be two or more persons holding or representing not less than 25 per cent. of the CBBCs for the time being remaining unexercised, or at any adjourned meeting two or more persons being or representing Holders whatever the number of CBBCs so held or represented.

A resolution will be an Extraordinary Resolution when it has been passed at a duly convened meeting by not less than three-quarters of the votes cast by such Holders who, being entitled to do so, vote in person or by proxy.

An Extraordinary Resolution passed at any meeting of the Holders shall be binding on all the Holders, whether or not they are present at the meeting.

Resolutions can be passed in writing without a meeting of the Holders being held if passed unanimously.

(B) *Modification.* The Issuer may, without the consent of the Holders, effect any modification of the terms and conditions of the CBBCs or the Instrument which, in the opinion of the Issuer, is (i) not materially prejudicial to the interests of the Holders generally (without considering the circumstances of any individual Holder or the tax or other consequences of such modification in any particular jurisdiction); (ii) of a formal, minor or technical nature; (iii) made to correct a manifest error; or (iv) necessary in order to comply with mandatory provisions of the laws or regulations of Hong Kong. Any such modification shall be binding on the Holders and shall be notified to them by the Issuer as soon as practicable thereafter in accordance with Condition 10.

10. Notices

All notices to the Holders will be validly given if published in English and in Chinese on the HKEX website. In such circumstances, the Issuer shall not be required to despatch copies of the notice to the Holders.

11. Liquidation

In the event of a liquidation or dissolution of the Company or the appointment of a liquidator, receiver or administrator or analogous person under any applicable law in respect of the whole or substantially the whole of its undertaking, property or assets, all unexercised CBBCs will lapse and shall cease to be valid for any purpose. In the case of voluntary liquidation, the unexercised CBBCs will lapse and shall cease to be valid on the effective date of the relevant resolution and, in the case of an involuntary liquidation or dissolution, on the date of the relevant court order or, in the case of the appointment of a liquidator or receiver or administrator or analogous person under any applicable law in respect of the whole or substantially the whole of its undertaking, property or assets, on the date when such appointment is effective but subject (in any such case) to any contrary mandatory requirement of law.

12. Further Issues

The Issuer shall be at liberty from time to time, without the consent of the Holders, to create and issue further CBBCs so as to form a single series with the CBBCs.

13. Delisting

(A) If at any time the Shares cease to be listed on the Stock Exchange, the Issuer shall give effect to these Conditions in such manner and make such adjustments and amendments to the rights attaching to the CBBCs as it shall, in its absolute discretion, consider appropriate to ensure, so far as it is reasonably able to do so, that the interests of the Holders generally are not materially prejudiced as a consequence of such delisting (without considering the circumstances of any individual Holder or the tax or other consequences that may result in any particular jurisdiction).

(B) Without prejudice to the generality of Condition 13(A), where the Shares are, or, upon the delisting, become, listed on any other stock exchange, these Conditions may, in the absolute discretion of the Issuer, be amended to the extent necessary to allow for the substitution of that other stock exchange in place of the Stock Exchange and the Issuer may, without the consent of the Holders, make such adjustments to the entitlements of the Holders on exercise (including, if appropriate, by converting foreign currency amounts at prevailing market rates into the relevant currency) as may be appropriate in the circumstances.

(C) The Issuer shall determine, in its absolute discretion, any adjustment or amendment and its determination shall be conclusive and binding on the Holders save in the case of manifest error. Notice of any adjustments or amendments shall be given to the Holders in accordance with Condition 10 as soon as practicable after they are determined.

14. Good Faith and Commercially Reasonable Manner

Any exercise of discretion by the Issuer under these Conditions will be made in good faith and in a commercially reasonable manner.

15. Governing Law

The CBBCs and the Instrument are governed by and construed in accordance with the laws of the Hong Kong Special Administrative Region of the People's Republic of China ("**Hong Kong**"). The Issuer and each Holder (by its purchase of the CBBCs) submit for all purposes in connection with the CBBCs and the Instrument to the non-exclusive jurisdiction of the courts of Hong Kong.

16. Contracts (Rights of Third Parties) Ordinance

A person who is not a party to these Conditions has no right under the Contracts (Rights of Third Parties) Ordinance (Cap. 623 of the Laws of Hong Kong) to enforce or to enjoy the benefit of any term of the CBBCs.

17. Language

A Chinese translation of these Conditions will be made available for collection during normal office hours from the Sponsor at 52nd Floor, Two International Finance Centre, 8 Finance Street, Central, Hong Kong. In the event of any inconsistency between the Chinese translation and the English version of these Conditions, the English version of these Conditions shall prevail.

18. Prescription

Claims against the Issuer for payment of any amount in respect of the CBBCs will become void unless made within ten years after the MCE Valuation Period or the Expiry Date (as the case may be) and thereafter, any sums payable in respect of such CBBCs shall be forfeited and shall revert to the Issuer.

Sponsor:
UBS Securities Asia Limited
52nd Floor
Two International Finance Centre
8 Finance Street, Central
Hong Kong

PART B — TERMS AND CONDITIONS OF CASH SETTLED CALLABLE BULL/BEAR CONTRACTS OVER AN INDEX

These Conditions will, together with the supplemental provisions contained in the relevant Launch Announcement and Supplemental Listing Document, and subject to completion and amendment, be endorsed on the Global Certificate. The relevant Launch Announcement and Supplemental Listing Document in relation to the issue of any series of CBBCs may specify other terms and conditions which shall, to the extent so specified or to the extent they are inconsistent with these Conditions, replace or modify these Conditions for the purpose of such series of CBBCs.

1. Form, Status, Transfer, Title and Additional Costs and Expenses

(A) The CBBCs (which expression shall, unless the context otherwise requires, include any further CBBCs issued pursuant to Condition 11) relating to the Index are issued in registered form subject to and with the benefit of an instrument by way of deed poll (the "**Instrument**" as defined more fully in the relevant Launch Announcement and Supplemental Listing Document) executed by UBS AG (the "**Issuer**") acting through its London branch or any of its branches outside Switzerland as it may specify from time to time. The Holders (as defined below) are entitled to the benefit of, are bound by, and are deemed to have notice of all the provisions of the Instrument. A copy of the Instrument is available for inspection at UBS Securities Asia Limited ("**Sponsor**") at 52nd Floor, Two International Finance Centre, 8 Finance Street, Central, Hong Kong.

The CBBCs are represented by a global certificate ("**Global Certificate**") registered in the name of HKSCC Nominees Limited (or such other nominee company as may be used by Hong Kong Securities Clearing Company Limited ("**HKSCC**") from time to time in relation to the provision of nominee services to persons admitted for the time being by HKSCC as a participant of CCASS) (the "**Nominee**"). No definitive certificate will be issued. The CBBCs can only be exercised by HKSCC or the Nominee.

(B) The settlement obligation of the Issuer in respect of the CBBCs represents general unsecured contractual obligations of the Issuer and of no other person which rank, and will rank, equally among themselves and pari passu with all other present and future unsecured and unsubordinated contractual obligations of the Issuer, except for obligations accorded preference by mandatory provisions of applicable law.

CBBCs represent general contractual obligations of the Issuer, and are not, nor is it the intention (expressed, implicit or otherwise) of the Issuer to create by the issue of CBBCs deposit liabilities of the Issuer or a debt obligation of any kind.

(C) Transfers of CBBCs may be effected only in Board Lots or integral multiples thereof in CCASS in accordance with the General Rules of CCASS and the CCASS Operational Procedures in effect from time to time (the "**CCASS Rules**").

(D) Each person who is for the time being shown in the register kept by the Issuer in Hong Kong as the holder shall be treated by the Issuer and the Sponsor as the absolute owner and holder of the CBBCs. The expressions "**Holder**" and "**Holders**" shall be construed accordingly.

(E) Holders are responsible for additional costs and expenses in connection with any exercise of the CBBCs including the Exercise Expenses (as defined below) which amount shall, subject to Condition 4(G) and to the extent necessary, be payable to the Issuer and collected from the Holders.

2. Definitions

For the purposes of these Conditions:

"**Board Lot**" has the meaning given to it in the relevant Launch Announcement and Supplemental Listing Document;

"**Business Day**" means a day (excluding Saturdays) on which the Stock Exchange is scheduled to open for dealings in Hong Kong and banks are open for business in Hong Kong;

"**Call Level**" means the level specified as such in the relevant Launch Announcement and Supplemental Listing Document, subject to any adjustment in accordance with Condition 6;

"**Cash Settlement Amount**" means, for every Board Lot, an amount calculated by the Issuer in accordance with the following formula (and, if appropriate, either (i) converted (if applicable) into the Settlement Currency at the Exchange Rate or, as the case may be, (ii) converted into the Interim Currency at the First Exchange Rate and then (if applicable) converted into Settlement Currency at the Second Exchange Rate):

(i) following a Mandatory Call Event:

  (a) in the case of a series of Category R CBBCs, the Residual Value; or

  (b) in the case of a series of Category N CBBCs, zero.

(ii) at expiry:

  (a) in the case of a series of bull CBBCs:

$$\text{Cash Settlement Amount per Board Lot} = \frac{(\text{Closing Level} - \text{Strike Level}) \times \text{one Board Lot} \times \text{Index Currency Amount}}{\text{Divisor}}$$

  (b) in the case of a series of bear CBBCs:

$$\text{Cash Settlement Amount per Board Lot} = \frac{(\text{Strike Level} - \text{Closing Level}) \times \text{one Board Lot} \times \text{Index Currency Amount}}{\text{Divisor}}$$

For the avoidance of doubt, if the Cash Settlement Amount is a negative figure, it shall be deemed to be zero;

"**Category N CBBCs**" means a series of CBBCs where the Call Level is equal to the Strike Level;

"**Category R CBBCs**" means a series of CBBCs where the Call Level is different from the Strike Level;

"**CCASS**" means the Central Clearing and Settlement System;

"**CCASS Settlement Day**" has the meaning ascribed to the term "Settlement Day" in the CCASS Rules, subject to such modification and amendment prescribed by HKSCC from time to time;

"**Closing Level**" means the level specified as such in the relevant Launch Announcement and Supplemental Listing Document subject to any adjustment in accordance with Condition 6;

"**Divisor**" means the number specified as such in the relevant Launch Announcement and Supplemental Listing Document;

"**Exchange Rate**" means the rate specified as such in the relevant Launch Announcement and Supplemental Listing Document;

"**Exercise Expenses**" means any charges or expenses including any taxes or duties which are incurred in respect of the exercise of a Board Lot of CBBCs;

"**Expiry Date**" means the date specified as such in the relevant Launch Announcement and Supplemental Listing Document;

“**First Exchange Rate**” means the rate specified as such in the relevant Launch Announcement and Supplemental Listing Document;

“**Index**” means the index specified as such in the relevant Launch Announcement and Supplemental Listing Document;

“**Index Business Day**” means any day on which the Index Exchange is scheduled to open for trading for its regular trading sessions;

“**Index Compiler**” means the index compiler specified as such in the relevant Launch Announcement and Supplemental Listing Document;

“**Index Currency Amount**” has the meaning given to it in the relevant Launch Announcement and Supplemental Listing Document;

“**Index Exchange**” means the index exchange specified as such in the relevant Launch Announcement and Supplemental Listing Document;

“**Interim Currency**” means the currency specified as such in the relevant Launch Announcement and Supplemental Listing Document;

“**Listing Date**” means the date specified as such in the relevant Launch Announcement and Supplemental Listing Document;

“**Mandatory Call Event**” occurs when the Spot Level of the Index is, at any time on any Index Business Day during the Observation Period:

(a) in the case of a series of bull CBBCs, at or below the Call Level; or

(b) in the case of a series of bear CBBCs, at or above the Call Level;

“**Market Disruption Event**” means:

(i) the occurrence or existence, on any Trading Day or Index Business Day during the one-half hour period that ends at the close of trading on the Index Exchange, of any of:

    (1) the suspension or material limitation of the trading of a material number of constituent securities that comprise the Index;

    (2) the suspension or material limitation of the trading of options or futures contracts relating to the Index on any exchanges on which such contracts are traded; or

    (3) the imposition of any exchange controls in respect of any currencies involved in determining the Cash Settlement Amount.

    For the purposes of this paragraph (i), (a) the limitation of the number of hours or days of trading will not constitute a Market Disruption Event if it results from an announced change in the regular business hours of any relevant exchange, and (b) a limitation on trading imposed by reason of the movements in price exceeding the levels permitted by any relevant exchange will constitute a Market Disruption Event;

(ii) where the Index Exchange is the Stock Exchange, the issuance of the tropical cyclone warning signal number 8 or above or the issuance of a “BLACK” rainstorm signal on any day which either (i) results in the Stock Exchange being closed for trading for the entire day; or (ii) results in the Stock Exchange being closed prior to its regular time for close of trading for the relevant day (for the avoidance of doubt, in the case when the Stock

Exchange is scheduled to open for the morning trading session only, closed prior to its regular time for close of trading for the morning session), PROVIDED THAT there shall be no Market Disruption Event solely by reason of the Stock Exchange opening for trading later than its regular time for opening of trading on any day as a result of the tropical cyclone warning signal number 8 or above or the "BLACK" rainstorm signal having been issued;

(iii) a limitation or closure of the Index Exchange due to any unforeseen circumstances; or

(iv) any circumstances beyond the control of the Issuer in which the Closing Level or, if applicable, the Exchange Rate, the First Exchange Rate or the Second Exchange Rate (as the case may be) cannot be determined by the Issuer in the manner set out in these Conditions or in such other manner as the Issuer considers appropriate at such time after taking into account all the relevant circumstances.

"**Maximum Index Level**" means the highest Spot Level of the Index during the MCE Valuation Period;

"**MCE Valuation Period**" means the period commencing from and including the moment upon which the Mandatory Call Event occurs (the trading session during which the Mandatory Call Event occurs is the "**1st Session**") and up to the end of the trading session on the Index Exchange immediately following the 1st Session ("**2nd Session**") unless, in the determination of the Issuer in its good faith, the 2nd Session for any reason (including, without limitation, a Market Disruption Event occurring and subsisting in the 2nd Session) does not contain any continuous period of 1 hour or more than 1 hour during which Spot Levels are available, the MCE Valuation Period shall be extended to the end of the subsequent trading session on the Index Exchange following the 2nd Session during which Spot Levels are available for a continuous period of at least 1 hour notwithstanding the existence or continuance of a Market Disruption Event in such postponed trading session, unless the Issuer determines in its good faith that each trading session on each of the four Index Business Days immediately following the date on which the Mandatory Call Event occurs does not contain any continuous period of 1 hour or more than 1 hour during which Spot Levels are available. In that case:

(i) the period commencing from the 1st Session up to, and including, the last trading session of the fourth Index Business Day on the Index Exchange immediately following the date on which the Mandatory Call Event occurs shall be deemed to be the MCE Valuation Period; and

(ii) the Issuer shall determine the Maximum Index Level or the Minimum Index Level (as the case may be) having regard to the then prevailing market conditions, the last reported Spot Level of the Index and such other factors as the Issuer may determine to be relevant in its good faith.

For the avoidance of doubt, all Spot Levels available throughout the extended MCE Valuation Period shall be taken into account to determine the Maximum Index Level or the Minimum Index Level (as the case may be) for the calculation of the Residual Value.

For the purposes of this definition,

(a) the pre-opening session, the morning session and, in the case of half day trading, the closing auction session (if any) of the same day; and

(b) the afternoon session and the closing auction session (if any) of the same day, shall each be considered as one trading session only;

"**Minimum Index Level**" means the lowest Spot Level of the Index during the MCE Valuation Period;

"**Observation Commencement Date**" means the date specified as such in the relevant Launch Announcement and Supplemental Listing Document;

"**Observation Period**" means the period commencing from and including the Observation Commencement Date and ending on and including the Trading Day immediately preceding the Expiry Date;

"**Post MCE Trades**" has the meaning given to it in the relevant Launch Announcement and Supplemental Listing Document, subject to such modification and amendment prescribed by the Stock Exchange from time to time;

"**Residual Value**" means, for every Board Lot, an amount calculated by the Issuer in accordance with the following formula (and, if appropriate, either (a) converted (if applicable) into the Settlement Currency at the Exchange Rate or, as the case may be, (b) converted into the Interim Currency at the First Exchange Rate and then (if applicable) converted into Settlement Currency at the Second Exchange Rate):

(i) in the case of a series of bull CBBCs:

$$\text{Residual Value per Board Lot} = \frac{(\text{Minimum Index Level} - \text{Strike Level}) \times \text{one Board Lot} \times \text{Index Currency Amount}}{\text{Divisor}}$$

(ii) in the case of a series of bear CBBCs:

$$\text{Residual Value per Board Lot} = \frac{(\text{Strike Level} - \text{Maximum Index Level}) \times \text{one Board Lot} \times \text{Index Currency Amount}}{\text{Divisor}}$$

"**Second Exchange Rate**" means the rate specified as such in the relevant Launch Announcement and Supplemental Listing Document;

"**Settlement Currency**" means the currency specified as such in the relevant Launch Announcement and Supplemental Listing Document;

"**Settlement Date**" means the third CCASS Settlement Day after (i) the end of the MCE Valuation Period or (ii) the later of: (a) the Expiry Date; and (b) the day on which the Closing Level is determined in accordance with the Conditions (as the case may be);

"**Spot Level**" means the spot level of the Index as compiled and published by the Index Compiler;

"**Stock Exchange**" means The Stock Exchange of Hong Kong Limited;

"**Strike Level**" means the level specified as such in the relevant Launch Announcement and Supplemental Listing Document subject to any adjustment in accordance with Condition 6;

"**Trading Day**" means any day on which the Stock Exchange is scheduled to open for trading for its regular trading sessions; and

"**Valuation Date**" means the date specified as such in the relevant Launch Announcement and Supplemental Listing Document.

Other capitalised terms shall, unless otherwise defined herein, bear the meaning ascribed to them in the Base Listing Document, any addendum to the Base Listing Document, the relevant Launch Announcement and Supplemental Listing Document or the Global Certificate.

3. Hedging Disruption and Illegality or Impracticability

(A) Hedging Disruption

(i) *Notification.* The Issuer shall as soon as reasonably practicable give notice to the Holders in accordance with Condition 10:

(1) if it determines that a Hedging Disruption Event has occurred; and

(2) of the consequence of such Hedging Disruption Event as determined by the Issuer pursuant to Condition 3(A)(iii).

(ii) *Hedging Disruption Event.* A "**Hedging Disruption Event**" occurs if the Issuer determines in good faith and in a commercially reasonable manner that it is or has become not reasonably practicable or it has otherwise become undesirable, for any reason, for the Issuer wholly or partially (a) to establish, re-establish, substitute or maintain a relevant hedging transaction (including, without limitation, any hedging transaction with respect to options or futures relating to the Index, or any currency in which the components of the Index are denominated) (a "**Relevant Hedging Transaction**") it deems necessary or desirable to hedge the Issuer's obligations in respect of the CBBCs or (b) to freely realize, recover, receive, repatriate, remit or transfer the proceeds of the Relevant Hedging Transactions between accounts within the jurisdiction of the Relevant Hedging Transactions (the "**Affected Jurisdiction**") or from accounts within the Affected Jurisdiction to accounts outside of the Affected Jurisdiction. The reasons for such determination by the Issuer may include, but are not limited to, the following:

(1) any material illiquidity in the market for the components of the Index;

(2) a change in any applicable law (including, without limitation, any tax law) or the promulgation of, or change in, the interpretation of any court, tribunal or regulatory authority with competent jurisdiction of any applicable law (including any action taken by a taxing authority);

(3) a material decline in the creditworthiness of a party with whom the Issuer has entered into any such Relevant Hedging Transaction; or

(4) the general unavailability of:

(A) market participants who will agree to enter into a Relevant Hedging Transaction; or

(B) market participants who will so enter into a Relevant Hedging Transaction on commercially reasonable terms.

(iii) *Consequences.* The Issuer, in the event of a Hedging Disruption Event, may determine to:

(1) terminate the CBBCs. In such circumstances the Issuer will, however, if and to the extent permitted by the applicable law, pay to each Holder in respect of each CBBC held by such Holder an amount that the Issuer determines in good faith and in a commercially reasonable manner to be the fair market value of the CBBC immediately prior to such termination less the cost to the Issuer of unwinding any related hedging arrangements. Payment will be made to the Holder in such manner as shall be notified to the Holder in accordance with Condition 10; or

(2) make any other adjustment to the Conditions as it considers appropriate in order to maintain the theoretical value of the CBBCs after adjusting for the relevant Hedging Disruption Event.

(B) Illegality or Impracticability

The Issuer is entitled to terminate the CBBCs if it determines in good faith and in a commercially reasonable manner that, for reasons beyond its control, it has become or it will become illegal or impracticable:

(i) for it to perform its obligations under the CBBCs in whole or in part as a result of:

(1) the adoption of, or any change in, any relevant law or regulation (including any tax law); or

(2) the promulgation of, or any change in, the interpretation by any court, tribunal, governmental, administrative, legislative, regulatory or judicial authority or power with competent jurisdiction of any relevant law or regulation (including any tax law),

(each of (1) and (2), a "**Change in Law Event**"); or

(ii) for it or any of its affiliates to maintain the Issuer's hedging arrangements with respect to the CBBCs due to a Change in Law Event.

Upon the occurrence of a Change in Law Event, the Issuer will, if and to the extent permitted by the applicable law or regulation, pay to each Holder a cash amount that the Issuer determines in good faith and in a commercially reasonable manner to be the fair market value in respect of each CBBC held by such Holder immediately prior to such termination (ignoring such illegality or impracticability) less the cost to the Issuer of unwinding any related hedging arrangement as determined by the Issuer in its sole and absolute discretion. Payment will be made to each Holder in such manner as shall be notified to the Holder in accordance with Condition 10.

4. EXERCISE OF CBBCS

(A) CBBCs may only be exercised in Board Lots or integral multiples thereof.

(B) If no Mandatory Call Event has occurred during the Observation Period, the CBBCs will be deemed to be automatically exercised on the Expiry Date.

(C) Mandatory Call Event

(i) Subject to paragraph (ii) below, following a Mandatory Call Event, the CBBCs will terminate automatically and the Issuer shall have no further obligation under the CBBCs except for the payment of the Cash Settlement Amount (if any) following the Mandatory Call Event on the relevant Settlement Date. The Issuer will give notice to the Holders in accordance with Condition 10. Trading in the CBBCs will be suspended immediately upon the occurrence of a Mandatory Call Event and any Post MCE Trades will be cancelled and will not be recognised by the Issuer or the Stock Exchange.

Revocation

(ii) A Mandatory Call Event is irrevocable unless it is triggered as a result of any of the following events:

(1) system malfunction or other technical errors of Hong Kong Exchanges and Clearing Limited ("**HKEX**") (such as the setting up of wrong Call Level and other parameters); or

(2) manifest errors caused by the relevant third party price source where applicable (such as miscalculation of the index level by the relevant index compiler);

and

(A) in the case of a system malfunction or other technical errors prescribed in paragraph (1) above, such event is reported by the Stock Exchange to the Issuer and the Issuer and the Stock Exchange mutually agree that such Mandatory Call Event is to be revoked; and

(B) in the case of an error by the relevant price source prescribed in paragraph (2) above, such event is reported by the Issuer to the Stock Exchange and the Issuer and the Stock Exchange mutually agree that such Mandatory Call Event is to be revoked,

and in each case, such mutual agreement must be reached no later than 30 minutes before the commencement of trading (including the pre-opening session) (Hong Kong time) on the Trading Day of the Stock Exchange immediately following the day on which the Mandatory Call Event occurs or such other time frame as prescribed by the Stock Exchange from time to time.

(D) Every Board Lot of CBBCs entitles the Holder to receive from the Issuer on the Settlement Date the Cash Settlement Amount (if any).

(E) Any Exercise Expenses which are not determined by the Issuer by the Business Day after the MCE Valuation Period or the Expiry Date (as the case may be) and deducted from the Cash Settlement Amount prior to delivery to the Holders in accordance with this Condition 4, shall be notified by the Issuer to the Holders as soon as practicable after determination thereof and shall be paid by the Holders to the Issuer immediately upon demand.

(F) In the event that the CBBCs have been exercised or have expired worthless, the Issuer will, with effect from the first Business Day following the MCE Valuation Period or Expiry Date, as the case may be, remove the name of each Holder from the register of Holders in respect of such CBBCs and thereby cancel the relevant CBBCs and, if applicable, cancel the Global Certificate.

(G) Upon exercise following a Mandatory Call Event or on the Expiry Date in accordance with these Conditions, the Issuer will pay the Cash Settlement Amount minus the determined Exercise Expenses to the relevant Holder. If the Cash Settlement Amount is equal to or less than the determined Exercise Expenses, no amount is payable.

The aggregate Cash Settlement Amount minus the determined aggregate Exercise Expenses shall be despatched no later than the Settlement Date, by crediting that amount, in accordance with the CCASS Rules, to the relevant bank account designated by a Holder (the "**Designated Bank Account**").

If as a result of an event beyond the control of the Issuer ("**Settlement Disruption Event**"), it is not possible for the Issuer to procure payment electronically through CCASS by crediting the relevant Designated Bank Account of a Holder on the original Settlement Date, the Issuer shall use its reasonable endeavours to procure payment electronically through CCASS by crediting the relevant Designated Bank Account of the Holder as soon as reasonably practicable after the original Settlement Date. The Issuer will not be liable to the Holder for any interest in respect of the amount due or any loss or damage that such Holder may suffer as a result of the existence of a Settlement Disruption Event.

If the Issuer determines, in its sole discretion, that a Market Disruption Event has occurred on the Valuation Date, then the Issuer shall determine the Closing Level on the basis of its good faith estimate of the Closing Level that would have prevailed on that day but for the occurrence of the Market Disruption Event provided that the Issuer may, if applicable, but shall not be obliged to, determine such Closing Level by having regard to the manner in which futures contracts relating to the Index are calculated.

(H) None of the Issuer, the Sponsor or their respective agents shall have any responsibility for any errors or omissions in the calculation and dissemination of any variables published by a third party and used in any calculation made pursuant to these Conditions or in the calculation of the Cash Settlement Amount arising from such errors or omissions.

The purchase of CBBCs does not confer on any Holder of such CBBCs any rights (whether in respect of voting, distributions or otherwise) in relation to the constituent securities, contracts, commodities or currencies comprising the Index.

(I) Exercise and settlement of the CBBCs is subject to all applicable laws, rules, regulations and guidelines in force at the relevant time and neither the Issuer nor the Sponsor shall incur any liability whatsoever if it is unable to effect the transactions contemplated, after using all reasonable efforts, as a result of any such laws, rules, regulations or guidelines. Neither the Issuer nor the Sponsor shall under any circumstances be liable for any acts or defaults of the CCASS in relation to the performance of its duties in relation to the CBBCs.

(J) Subject to Condition 4(C)(ii), trading in CBBCs on the Stock Exchange shall cease (i) immediately upon the occurrence of a Mandatory Call Event or (ii) at the close of trading for the Trading Day immediately preceding the Expiry Date (for the avoidance of doubt, in the case when the Stock Exchange is scheduled to open for the morning session only, at the close of trading for the morning session), whichever is the earlier. All Post MCE Trades will be invalid and will be cancelled, and will not be recognised by the Issuer or the Stock Exchange.

5. Sponsor

(A) The Sponsor will not assume any obligation or duty to or any relationship or agency or trust for the Holders.

(B) The Issuer reserves the right, subject to the appointment of a successor, at any time to vary or terminate the appointment of the initial Sponsor and to appoint another agent provided that it will at all times maintain a sponsor in Hong Kong for so long as the CBBCs are listed on the Stock Exchange. Notice of any such termination or appointment will be given to the Holders in accordance with Condition 10.

6. Adjustments to the Index

(A) *Successor Index Compiler Calculates and Reports Index.* If the Index is (i) not calculated and announced by the Index Compiler but is calculated and published by a successor to the Index Compiler (the "**Successor Index Compiler**") acceptable to the Issuer or (ii) replaced by a successor index using, in the determination of the Issuer, the same or a substantially similar formula for and method of calculation as used in the calculation of the Index, then the Index will be deemed to be the index so calculated and announced by the Successor Index Compiler or that successor index, as the case may be.

(B) *Modification and Cessation of Calculation of Index.* If (i) on or prior to the Valuation Date the Index Compiler or (if applicable) the Successor Index Compiler makes a material change in the formula for or the method of calculating the Index or in any other way materially modifies the Index (other than a modification prescribed in that formula or method to maintain the Index in the event of changes in constituent securities, contracts, commodities or currencies and other routine events), or (ii) on the Valuation Day the Index Compiler or (if applicable) the Successor Index Compiler fails to calculate and publish the Index (other than as a result of a Market Disruption Event), then the Issuer shall determine the Closing Level using, in lieu of a published level for the Index, the level for the Index as at that Index Business Day as determined by the Issuer in accordance with the formula for and method of calculating the Index last in effect prior to that change or failure, but using only those securities, contracts, commodities or currencies that comprised the Index immediately prior to that change or failure (other than those securities that have since ceased to be listed on the relevant exchange).

(C) *Other Adjustments.* Without prejudice to and notwithstanding any prior adjustment(s) made pursuant to the applicable Conditions, the Issuer may (but shall not be obliged to) make such other adjustments to the terms and conditions of the CBBCs as appropriate where any event (including the events as contemplated in the applicable Conditions) occurs and irrespective of, in substitution for, or in addition to the provisions contemplated in the applicable Conditions, provided that such adjustment is:

(i) not materially prejudicial to the interests of the Holders generally (without considering the circumstances of any individual Holder or the tax or other consequences of such adjustment in any particular jurisdiction); or

(ii) determined by the Issuer in good faith to be appropriate and commercially reasonable.

(D) *Notice of Adjustments.* All determinations made by the Issuer pursuant hereto will be conclusive and binding on the Holders. The Issuer will give, or procure that there is given, notice as soon as practicable of any adjustment and of the date from which such adjustment is effective by publication in accordance with Condition 10.

7. Purchase

The Issuer or any of its subsidiaries may at any time purchase CBBCs at any price in the open market or by tender or by private treaty. Any CBBCs so purchased may be held or resold or surrendered for cancellation.

8. Global Certificate

A Global Certificate representing the CBBCs will be deposited with CCASS in the name of HKSCC Nominees Limited. The Global Certificate must be executed manually on behalf of the Issuer by authorised officer(s) or attorney(s) of the Issuer.

9. Meetings of Holders and Modification

(A) *Meetings of Holders.* The Instrument contains provisions for convening meetings of the Holders to consider any matter affecting their interests, including the sanctioning by Extraordinary Resolution (as defined in the Instrument) of a modification of the provisions of the CBBCs or of the Instrument.

Any resolution to be passed in a meeting of the Holders shall be decided by poll. Such a meeting may be convened by the Issuer or by Holders holding not less than 10 per cent. of the CBBCs for the time being remaining unexercised. The quorum at any such meeting for passing an Extraordinary Resolution will be two or more persons holding or representing not less than 25 per cent. of the CBBCs for the time being remaining unexercised, or at any adjourned meeting two or more persons being or representing Holders whatever the number of CBBCs so held or represented.

A resolution will be an Extraordinary Resolution when it has been passed at a duly convened meeting by not less than three-quarters of the votes cast by such Holders who, being entitled to do so, vote in person or by proxy.

An Extraordinary Resolution passed at any meeting of the Holders shall be binding on all the Holders, whether or not they are present at the meeting.

Resolutions can be passed in writing without a meeting of the Holders being held if passed unanimously.

(B) *Modification.* The Issuer may, without the consent of the Holders, effect any modification of the terms and conditions of the CBBCs or the Instrument which, in the opinion of the Issuer, is (i) not materially prejudicial to the interests of the Holders generally (without considering the circumstances of any individual Holder or the tax or other consequences of such modification in any particular jurisdiction); (ii) of a formal, minor or technical nature; (iii) made to correct a manifest error; or (iv) necessary in order to comply with mandatory provisions of the laws or regulations of Hong Kong. Any such modification shall be binding on the Holders and shall be notified to them by the Issuer as soon as practicable thereafter in accordance with Condition 10.

10. Notices

All notices to the Holders will be validly given if published in English and in Chinese on the HKEX website. In such circumstances, the Issuer shall not be required to despatch copies of the notice to the Holders.

11. Further Issues

The Issuer shall be at liberty from time to time, without the consent of the Holders, to create and issue further CBBCs so as to form a single series with the CBBCs.

12. Good Faith and Commercially Reasonable Manner

Any exercise of discretion by the Issuer under these Conditions will be made in good faith and in a commercially reasonable manner.

13. Governing Law

The CBBCs and the Instrument are governed by and construed in accordance with the laws of the Hong Kong Special Administrative Region of the People's Republic of China ("**Hong Kong**"). The Issuer and each Holder (by its purchase of the CBBCs) submit for all purposes in connection with the CBBCs and the Instrument to the non-exclusive jurisdiction of the courts of Hong Kong.

14. Contracts (Rights of Third Parties) Ordinance

A person who is not a party to these Conditions has no right under the Contracts (Rights of Third Parties) Ordinance (Cap. 623 of the Laws of Hong Kong) to enforce or to enjoy the benefit of any term of the CBBCs.

15. Language

A Chinese translation of these Conditions will be made available for collection during normal office hours from the Sponsor at 52nd Floor, Two International Finance Centre, 8 Finance Street, Central, Hong Kong. In the event of any inconsistency between the Chinese translation and the English version of these Conditions, the English version of these Conditions shall prevail.

16. Prescription

Claims against the Issuer for payment of any amount in respect of the CBBCs will become void unless made within ten years after the MCE Valuation Period or the Expiry Date (as the case may be) and thereafter, any sums payable in respect of such CBBCs shall be forfeited and shall revert to the Issuer.

Sponsor:
UBS Securities Asia Limited
52nd Floor
Two International Finance Centre
8 Finance Street, Central
Hong Kong

PART C — TERMS AND CONDITIONS OF CASH SETTLED CALLABLE BULL/BEAR CONTRACTS OVER SINGLE UNIT TRUSTS

These Conditions will, together with the supplemental provisions contained in the relevant Launch Announcement and Supplemental Listing Document, and subject to completion and amendment, be endorsed on the Global Certificate. The relevant Launch Announcement and Supplemental Listing Document in relation to the issue of any series of CBBCs may specify other terms and conditions which shall, to the extent so specified or to the extent they are inconsistent with these Conditions, replace or modify these Conditions for the purpose of such series of CBBCs.

1. Form, Status, Transfer, Title and Additional Costs and Expenses

(A) The CBBCs (which expression shall, unless the context otherwise requires, include any further CBBCs issued pursuant to Condition 12) relating to the Units of the Trust are issued in registered form subject to and with the benefit of an instrument by way of deed poll (the "**Instrument**" as defined more fully in the relevant Launch Announcement and Supplemental Listing Document) executed by UBS AG (the "**Issuer**") acting through its London branch or any of its branches outside Switzerland as it may specify from time to time. The Holders (as defined below) are entitled to the benefit of, are bound by, and are deemed to have notice of all the provisions of the Instrument. A copy of the Instrument is available for inspection at the offices of UBS Securities Asia Limited ("**Sponsor**") at 52nd Floor, Two International Finance Centre, 8 Finance Street, Central, Hong Kong.

The CBBCs are represented by a global certificate ("**Global Certificate**") registered in the name of HKSCC Nominees Limited (or such other nominee company as may be used by Hong Kong Securities Clearing Company Limited ("**HKSCC**") from time to time in relation to the provision of nominee services to persons admitted for the time being by HKSCC as a participant of CCASS) (the "**Nominee**"). No definitive certificate will be issued. The CBBCs can only be exercised by HKSCC or the Nominee.

(B) The settlement obligation of the Issuer in respect of the CBBCs represents general unsecured contractual obligations of the Issuer and of no other person which rank, and will rank, equally among themselves and pari passu with all other present and future unsecured and unsubordinated contractual obligations of the Issuer, except for obligations accorded preference by mandatory provisions of applicable law.

CBBCs represent general contractual obligations of the Issuer, and are not, nor is it the intention (expressed, implicit or otherwise) of the Issuer to create by the issue of CBBCs deposit liabilities of the Issuer or a debt obligation of any kind.

(C) Transfers of CBBCs may be effected only in Board Lots or integral multiples thereof in CCASS in accordance with the General Rules of CCASS and the CCASS Operational Procedures in effect from time to time (the "**CCASS Rules**").

(D) Each person who is for the time being shown in the register kept by the Issuer in Hong Kong as the holder shall be treated by the Issuer and the Sponsor as the absolute owner and holder of the CBBCs. The expressions "**Holder**" and "**Holders**" shall be construed accordingly.

(E) Holders are responsible for additional costs and expenses in connection with any exercise of the CBBCs including the Exercise Expenses (as defined below) which amount shall, subject to Condition 4(G) and to the extent necessary, be payable to the Issuer and collected from the Holders.

2. Definitions

For the purposes of these Conditions:

"**Board Lot**" has the meaning given to it in the relevant Launch Announcement and Supplemental Listing Document;

“**Business Day**” means a day (excluding Saturdays) on which the Stock Exchange is scheduled to open for dealings in Hong Kong and banks are open for business in Hong Kong;

“**Call Price**” means the price specified as such in the relevant Launch Announcement and Supplemental Listing Document, subject to any adjustment in accordance with Condition 6;

“**Cash Settlement Amount**” means, for every Board Lot, an amount in the Settlement Currency calculated by the Issuer in accordance with the following formula:

(i) following a Mandatory Call Event:

(a) in the case of a series of Category R CBBCs, the Residual Value; or

(b) in the case of a series of Category N CBBCs, zero.

(ii) at expiry:

(a) in the case of a series of bull CBBCs:

$$\text{Cash Settlement Amount per Board Lot} = \frac{\text{Entitlement x (Closing Price - Strike Price) x one Board Lot}}{\text{Number of CBBC(s) per Entitlement}}$$

(b) in the case of a series of bear CBBCs:

$$\text{Cash Settlement Amount per Board Lot} = \frac{\text{Entitlement x (Strike Price - Closing Price) x one Board Lot}}{\text{Number of CBBC(s) per Entitlement}}$$

For the avoidance of doubt, if the Cash Settlement Amount is a negative figure, it shall be deemed to be zero;

“**Category N CBBCs**” means a series of CBBCs where the Call Price is equal to the Strike Price;

“**Category R CBBCs**” means a series of CBBCs where the Call Price is different from the Strike Price;

“**CCASS**” means the Central Clearing and Settlement System;

“**CCASS Settlement Day**” has the meaning ascribed to the term “Settlement Day” in the CCASS Rules, subject to such modification and amendment prescribed by HKSCC from time to time;

“**Closing Price**” means the closing price of one Unit (as derived from the Daily Quotation Sheet of the Stock Exchange, subject to any adjustment to such closing price as may be necessary to reflect any event as contemplated in Condition 6 such as capitalisation, rights issue, distribution or the like) on the Valuation Date;

“**Entitlement**” means the number specified as such in the relevant Launch Announcement and Supplemental Listing Document, subject to any adjustment in accordance with Condition 6;

“**Exercise Expenses**” means any charges or expenses including any taxes or duties which are incurred in respect of the exercise of a Board Lot of CBBCs;

“**Expiry Date**” means the date specified as such in the relevant Launch Announcement and Supplemental Listing Document;

"**Listing Date**" means the date specified as such in the relevant Launch Announcement and Supplemental Listing Document;

"**Mandatory Call Event**" occurs when the Spot Price of the Units on any Trading Day during the Observation Period is:

(i) in the case of a series of bull CBBCs, at or below the Call Price; or

(ii) in the case of a series of bear CBBCs, at or above the Call Price;

"**Market Disruption Event**" means:

(1) the occurrence or existence on any Trading Day during the one-half hour period that ends at the close of trading of any suspension of or limitation imposed on trading (by reason of movements in price exceeding limits permitted by the Stock Exchange or otherwise) on the Stock Exchange in (a) the Units; or (b) any options or futures contracts relating to the Units if, in any such case, such suspension or limitation is, in the determination of the Issuer, material;

(2) the issuance of the tropical cyclone warning signal number 8 or above or the issuance of a "BLACK" rainstorm signal on any day which either (i) results in the Stock Exchange being closed for trading for the entire day; or (ii) results in the Stock Exchange being closed prior to its regular time for close of trading for the relevant day (for the avoidance of doubt, in the case when the Stock Exchange is scheduled to open for the morning trading session only, closed prior to its regular time for close of trading for the morning session), PROVIDED THAT there shall be no Market Disruption Event solely by reason of the Stock Exchange opening for trading later than its regular time for opening of trading on any day as a result of the tropical cyclone warning signal number 8 or above or the "BLACK" rainstorm signal having been issued; or

(3) a limitation or closure of the Stock Exchange due to any unforeseen circumstances;

"**Maximum Trade Price**" means the highest Spot Price of the Units (subject to any adjustment to such Spot Price as may be necessary to reflect any event as contemplated in Condition 6 such as capitalisation, rights issue, distribution or the like) during the MCE Valuation Period;

"**MCE Valuation Period**" means the period commencing from and including the moment upon which the Mandatory Call Event occurs (the trading session during which the Mandatory Call Event occurs is the "**1st Session**") and up to the end of the trading session on the Stock Exchange immediately following the 1st Session ("**2nd Session**") unless, in the determination of the Issuer in its good faith, the 2nd Session for any reason (including, without limitation, a Market Disruption Event occurring and subsisting in the 2nd Session) does not contain any continuous period of 1 hour or more than 1 hour during which trading in the Units is permitted on the Stock Exchange with no limitation imposed, the MCE Valuation Period shall be extended to the end of the subsequent trading session following the 2nd Session during which trading in the Units is permitted on the Stock Exchange with no limitation imposed for a continuous period of at least 1 hour notwithstanding the existence or continuance of a Market Disruption Event in such postponed trading session, unless the Issuer determines in its good faith that each trading session on each of the four Trading Days immediately following the date on which the Mandatory Call Event occurs does not contain any continuous period of 1 hour or more than 1 hour during which trading in the Units is permitted on the Stock Exchange with no limitation imposed. In that case:

(i) the period commencing from the 1st Session up to, and including, the last trading session on the Stock Exchange of the fourth Trading Day immediately following the date on which the Mandatory Call Event occurs shall be deemed to be the MCE Valuation Period; and

(ii) the Issuer shall determine the Maximum Trade Price or the Minimum Trade Price (as the case may be) having regard to the then prevailing market conditions, the last reported Spot Price and such other factors as the Issuer may determine to be relevant in its good faith.

For the avoidance of doubt, all Spot Prices available throughout the extended MCE Valuation Period shall be taken into account to determine the Maximum Trade Price or the Minimum Trade Price (as the case may be) for the calculation of the Residual Value.

For the purposes of this definition,

(a) the pre-opening session, the morning session and, in the case of half day trading, the closing auction session (if any) of the same day; and

(b) the afternoon session and the closing auction session (if any) of the same day,

shall each be considered as one trading session only;

"**Minimum Trade Price**" means the lowest Spot Price of the Units (subject to any adjustment to such Spot Price as may be necessary to reflect any event as contemplated in Condition 6 such as capitalisation, rights issue, distribution or the like) during the MCE Valuation Period;

"**Observation Commencement Date**" means the date specified as such in the relevant Launch Announcement and Supplemental Listing Document;

"**Observation Period**" means the period commencing from and including the Observation Commencement Date and ending on and including the Trading Day immediately preceding the Expiry Date;

"**Post MCE Trades**" has the meaning given to it in the relevant Launch Announcement and Supplemental Listing Document, subject to such modification and amendment prescribed by the Stock Exchange from time to time;

"**Residual Value**" means, for every Board Lot, an amount in the Settlement Currency calculated by the Issuer in accordance with the following formula:

(i) in the case of a series of bull CBBCs:

$$\text{Residual Value per Board Lot} = \frac{\text{Entitlement x (Minimum Trade Price - Strike Price) x one Board Lot}}{\text{Number of CBBC(s) per Entitlement}}$$

(ii) in the case of a series of bear CBBCs:

$$\text{Residual Value per Board Lot} = \frac{\text{Entitlement x (Strike Price - Maximum Trade Price) x one Board Lot}}{\text{Number of CBBC(s) per Entitlement}}$$

"**Settlement Currency**" means the currency specified as such in the relevant Launch Announcement and Supplemental Listing Document;

"**Settlement Date**" means the third CCASS Settlement Day after (i) the end of the MCE Valuation Period or (ii) the later of: (a) the Expiry Date; and (b) the day on which the Closing Price is determined in accordance with the Conditions (as the case may be);

"**Spot Price**" means:

(a) in respect of a continuous trading session of the Stock Exchange, the price per Unit concluded by means of automatic order matching on the Stock Exchange as reported in the official real-time dissemination mechanism for the Stock Exchange during such continuous trading session in accordance with the Trading Rules, excluding direct business (as defined in the Trading Rules); and

(b) in respect of a pre-opening session or a closing auction session (if applicable) of the Stock Exchange, as the case may be, the final Indicative Equilibrium Price (as defined in the Trading Rules) of the Unit (if any) calculated at the end of the pre-order matching period of such pre-opening session or closing auction session (if applicable), as the case may be, in accordance with the Trading Rules, excluding direct business (as defined in the Trading Rules),

subject to such modification and amendment prescribed by the Stock Exchange from time to time;

"**Stock Exchange**" means The Stock Exchange of Hong Kong Limited;

"**Strike Price**" means the price specified as such in the relevant Launch Announcement and Supplemental Listing Document, subject to any adjustment in accordance with Condition 6;

"**Trading Day**" means any day on which the Stock Exchange is scheduled to open for trading for its regular trading sessions;

"**Trading Rules**" means the Rules and Regulations of the Exchange prescribed by the Stock Exchange from time to time;

"**Trust**" means the trust specified as such in the relevant Launch Announcement and Supplemental Listing Document;

"**Unit**" means the unit specified as such in the relevant Launch Announcement and Supplemental Listing Document; and

"**Valuation Date**" means the Trading Day immediately preceding the Expiry Date unless, in the determination of the Issuer, a Market Disruption Event has occurred on that day in which case, the Valuation Date shall be the first succeeding Trading Day on which the Issuer determines that there is no Market Disruption Event, unless the Issuer determines that there is a Market Disruption Event occurring on each of the four Trading Days immediately following the original date which (but for the Market Disruption Event) would have been the Valuation Date. In that case:

(a) the fourth Trading Day immediately following the original date shall be deemed to be the Valuation Date (regardless of the Market Disruption Event); and

(b) the Issuer shall determine the Closing Price having regard to the then prevailing market conditions, the last reported trading price of the Unit on the Stock Exchange and such other factors as the Issuer determines to be relevant.

Other capitalized terms shall, unless otherwise defined herein, have the meaning ascribed to them in the Base Listing Document, any addendum to the Base Listing Document, the relevant Launch Announcement and Supplemental Listing Document or the Global Certificate.

3. Hedging Disruption and Illegality or Impracticability

(A) Hedging Disruption

(i) *Notification.* The Issuer shall as soon as reasonably practicable give notice to the Holders in accordance with Condition 10:

(1) if it determines that a Hedging Disruption Event has occurred; and

(2) of the consequence of such Hedging Disruption Event as determined by the Issuer pursuant to Condition 3(A)(iii).

(ii) *Hedging Disruption Event.* A "**Hedging Disruption Event**" occurs if the Issuer determines in good faith and in a commercially reasonable manner that it is or has become not reasonably practicable or it has otherwise become undesirable, for any reason, for the Issuer wholly or partially to establish, re-establish, substitute or maintain a relevant hedging transaction (a "**Relevant Hedging Transaction**") it deems necessary or desirable to hedge the Issuer's obligations in respect of the CBBCs. The reasons for such determination by the Issuer may include, but are not limited to, the following:

(1) any material illiquidity in the market for the Units;

(2) a change in any applicable law (including, without limitation, any tax law) or the promulgation of, or change in, the interpretation of any court, tribunal or regulatory authority with competent jurisdiction of any applicable law (including any action taken by a taxing authority);

(3) a material decline in the creditworthiness of a party with whom the Issuer has entered into any such Relevant Hedging Transaction; or

(4) the general unavailability of:

(A) market participants who will agree to enter into a Relevant Hedging Transaction; or

(B) market participants who will so enter into a Relevant Hedging Transaction on commercially reasonable terms.

(iii) *Consequences.* The Issuer, in the event of a Hedging Disruption Event, may determine to:

(1) terminate the CBBCs. In such circumstances the Issuer will, however, if and to the extent permitted by the applicable law, pay to each Holder in respect of each CBBC held by such Holder an amount that the Issuer determines in good faith and in a commercially reasonable manner to be the fair market value of the CBBC immediately prior to such termination less the cost to the Issuer of unwinding any related hedging arrangements. Payment will be made to the Holder in such manner as shall be notified to the Holder in accordance with Condition 10; or

(2) make any other adjustment to the Conditions as it considers appropriate in order to maintain the theoretical value of the CBBCs after adjusting for the relevant Hedging Disruption Event.

(B) Illegality or Impracticability

The Issuer is entitled to terminate the CBBCs if it determines in good faith and in a commercially reasonable manner that, for reasons beyond its control, it has become or it will become illegal or impracticable:

(i) for it to perform its obligations under the CBBCs in whole or in part as a result of:

(1) the adoption of, or any change in, any relevant law or regulation (including any tax law); or

(2) the promulgation of, or any change in, the interpretation by any court, tribunal, governmental, administrative, legislative, regulatory or judicial authority or power with competent jurisdiction of any relevant law or regulation (including any tax law),

(each of (1) and (2), a "**Change in Law Event**"); or

(ii) for it or any of its affiliates to maintain the Issuer's hedging arrangements with respect to the CBBCs due to a Change in Law Event.

Upon the occurrence of a Change in Law Event, the Issuer will, if and to the extent permitted by the applicable law or regulation, pay to each Holder a cash amount that the Issuer determines in good faith and in a commercially reasonable manner to be the fair market value in respect of each CBBC held by such Holder immediately prior to such termination (ignoring such illegality or impracticability) less the cost to the Issuer of unwinding any related hedging arrangement as determined by the Issuer in its sole and absolute discretion. Payment will be made to each Holder in such manner as shall be notified to the Holder in accordance with Condition 10.

4. EXERCISE OF CBBCS

(A) CBBCs may only be exercised in Board Lots or integral multiples thereof.

(B) If no Mandatory Call Event has occurred during the Observation Period, the CBBCs will be deemed to be automatically exercised on the Expiry Date.

(C) Mandatory Call Event

(i) Subject to paragraph (ii) below, following a Mandatory Call Event, the CBBCs will terminate automatically and the Issuer shall have no further obligation under the CBBCs except for the payment of the Cash Settlement Amount (if any) following the Mandatory Call Event on the relevant Settlement Date. The Issuer will give notice to the Holders in accordance with Condition 10. Trading in the CBBCs will be suspended immediately upon the occurrence of a Mandatory Call Event and all Post MCE Trades will be cancelled and will not be recognised by the Issuer or the Stock Exchange.

Revocation

(ii) A Mandatory Call Event is irrevocable unless it is triggered as a result of any of the following events:

(1) system malfunction or other technical errors of Hong Kong Exchanges and Clearing Limited ("**HKEX**") (such as the setting up of wrong Call Price and other parameters); or

(2) manifest errors caused by the relevant third party price source where applicable;

and

(A) in the case of a system malfunction or other technical errors prescribed in paragraph (1) above, such event is reported by the Stock Exchange to the Issuer and the Issuer and the Stock Exchange mutually agree that such Mandatory Call Event is to be revoked; and

(B) in the case of an error by the relevant price source prescribed in paragraph (2) above, such event is reported by the Issuer to the Stock Exchange and the Issuer and the Stock Exchange mutually agree that such Mandatory Call Event is to be revoked,

in each case, such mutual agreement must be reached no later than 30 minutes before the commencement of trading (including the pre-opening session) (Hong Kong time) on the Trading Day of the Stock Exchange immediately following the day on which the Mandatory Call Event occurs or such other time frame as prescribed by the Stock Exchange from time to time.

(D) Every Board Lot of CBBCs entitles the Holder to receive from the Issuer on the Settlement Date the Cash Settlement Amount (if any).

(E) Any Exercise Expenses which are not determined by the Issuer by the Business Day after the MCE Valuation Period or the Expiry Date (as the case may be) and deducted from the Cash Settlement Amount prior to delivery to the Holders in accordance with this Condition 4, shall be notified by the Issuer to the Holders as soon as practicable after determination thereof and shall be paid by the Holders to the Issuer immediately upon demand.

(F) In the event that the CBBCs have been exercised or have expired worthless, the Issuer will, with effect from the first Business Day following the MCE Valuation Period or the Expiry Date, as the case may be, remove the name of each Holder from the register of Holders in respect of such CBBCs and thereby cancel the relevant CBBCs and, if applicable, cancel the Global Certificate.

(G) Upon exercise following a Mandatory Call Event or on the Expiry Date in accordance with these Conditions, the Issuer will pay the Cash Settlement Amount minus the determined Exercise Expenses to the relevant Holder. If the Cash Settlement Amount is equal to or less than the determined Exercise Expenses, no amount is payable.

The aggregate Cash Settlement Amount minus the determined aggregate Exercise Expenses shall be despatched no later than the Settlement Date, by crediting that amount, in accordance with the CCASS Rules, to the relevant bank account designated by each Holder (the "**Designated Bank Account**").

If as a result of an event beyond the control of the Issuer ("**Settlement Disruption Event**"), it is not possible for the Issuer to procure payment electronically through CCASS by crediting the relevant Designated Bank Account of the Holder on the original Settlement Date, the Issuer shall use its reasonable endeavours to procure payment electronically through CCASS by crediting the relevant Designated Bank Account of the Holder as soon as reasonably practicable after the original Settlement Date. The Issuer will not be liable to the Holder for any interest in respect of the amount due or any loss or damage that such Holder may suffer as a result of the existence of a Settlement Disruption Event.

(H) None of the Issuer, the Sponsor or their respective agents shall have any responsibility for any errors or omissions in the calculation and dissemination of any variables published by a third party and used in any calculation made pursuant to these Conditions or in the calculation of the Cash Settlement Amount arising from such errors or omissions.

The purchase of CBBCs does not confer on any Holder of such CBBCs any rights (whether in respect of voting, distributions or otherwise) in relation to the Units.

(I) Exercise and settlement of the CBBCs is subject to all applicable laws, rules, regulations and guidelines in force at the relevant time and neither the Issuer nor the Sponsor shall incur any liability whatsoever if it is unable to effect the transactions contemplated, after using all reasonable efforts, as a result of any such laws, rules, regulations or guidelines. Neither the Issuer nor the Sponsor shall under any circumstances be liable for any acts or defaults of the CCASS in relation to the performance of its duties in relation to the CBBCs.

(J) Subject to Condition 4(C)(ii), trading in CBBCs on the Stock Exchange shall cease (i) immediately upon the occurrence of a Mandatory Call Event or (ii) at the close of trading for the Trading Day immediately preceding the Expiry Date (for the avoidance of doubt, in the case when the Stock Exchange is scheduled to open for the morning session only, at the close of trading for the morning session), whichever is the earlier. All Post MCE Trades will be invalid and will be cancelled, and will not be recognised by the Issuer or the Stock Exchange.

5. Sponsor

(A) The Sponsor will not assume any obligation or duty to or any relationship or agency or trust for the Holders.

(B) The Issuer reserves the right, subject to the appointment of a successor, at any time to vary or terminate the appointment of the initial Sponsor and to appoint another sponsor provided that it will at all times maintain a sponsor in Hong Kong for so long as the CBBCs are listed on the Stock Exchange. Notice of any such termination or appointment will be given to the Holders in accordance with Condition 10.

6. Adjustments

(A) *Rights Issues.* If and whenever the Trust shall, by way of Rights (as defined below), offer new Units for subscription at a fixed subscription price to the holders of existing Units pro rata to existing holdings (a "**Rights Offer**"), the Entitlement shall be adjusted to take effect on the Business Day on which trading in the Units becomes ex-entitlement ("**Rights Issue Adjustment Date**") in accordance with the following formula:

Adjusted Entitlement = Adjustment Component x E

Where:

$$\text{Adjustment Component} = \frac{1 + M}{1 + (R/S) \times M}$$

E: Existing Entitlement immediately prior to the Rights Offer

S: Cum-Rights Unit price being the closing price of an existing Unit as derived from the Daily Quotation Sheet of the Stock Exchange on the last Business Day on which the Units are traded on a Cum-Rights basis

R: Subscription price per new Unit specified in the Rights Offer plus an amount equal to any distributions or other benefits foregone to exercise the Right

M: Number of new Unit(s) (whether a whole or a fraction) per existing Unit each holder thereof is entitled to subscribe

Provided that if the above formula would result in an adjustment to the Entitlement which would amount to one per cent. or less of the Entitlement immediately prior to the adjustment, then no adjustment will be made. In addition, the Issuer shall adjust the Strike Price and/or the Call Price (which shall be rounded to the nearest 0.001) by the reciprocal of the Adjustment Component, where the "**reciprocal of the Adjustment Component**" means one divided by the relevant Adjustment Component. The adjustment to the Strike Price and/or the Call Price shall take effect on the Rights Issue Adjustment Date.

For the purposes of these Conditions:

"**Rights**" means the right(s) attached to each existing Unit or needed to acquire one new Unit (as the case may be) which are given to the holders of existing Units to subscribe at a fixed subscription price for new Units pursuant to the Rights Offer (whether by the exercise of one Right, a part of a Right or an aggregate number of Rights).

(B) *Bonus Issues.* If and whenever the Trust shall make an issue of Units credited as fully paid to the holders of Units generally (other than pursuant to a scrip distribution or similar scheme for the time being operated by the Trust or otherwise in lieu of a cash distribution and without any payment or other consideration being made or given by such holders) (a "**Bonus Issue**") the Entitlement shall be adjusted to take effect on the Business Day on which trading in the Units becomes ex-entitlement ("**Bonus Issue Adjustment Date**") in accordance with the following formula:

Adjusted Entitlement = Adjustment Component x E

Where:

Adjustment Component = (1 + N)

E: Existing Entitlement immediately prior to the Bonus Issue

N: Number of additional Units (whether a whole or a fraction) received by a holder of Units for each Unit held prior to the Bonus Issue

Provided that if the above formula would result in an adjustment to the Entitlement which would amount to one per cent. or less of the Entitlement immediately prior to the adjustment, then no adjustment will be made. In addition, the Issuer shall adjust the Strike Price and/or the Call Price (which shall be rounded to the nearest 0.001) by the reciprocal of the Adjustment Component, where the "**reciprocal of the Adjustment Component**" means one divided by the relevant Adjustment Component. The adjustment to the Strike Price and/or the Call Price shall take effect on the Bonus Issue Adjustment Date.

(C) *Subdivisions and Consolidations.* If and whenever the Trust shall subdivide its Units or any class of its outstanding Units into a greater number of units (a "**Subdivision**") or consolidate the Units or any class of its outstanding Units into a smaller number of units (a "**Consolidation**"), then:

(i) in the case of a Subdivision, the Entitlement in effect immediately prior thereto will be increased whereas the Strike Price and/or the Call Price (which shall be rounded to the nearest 0.001) will be decreased in the same ratio as the Subdivision; and

(ii) in the case of a Consolidation, the Entitlement in effect immediately prior thereto will be decreased whereas the Strike Price and/or the Call Price (which shall be rounded to the nearest 0.001) will be increased in the same ratio as the Consolidation,

in each case on the day on which the Subdivision or Consolidation (as the case may be) shall have taken effect.

(D) *Restructuring Events.* If it is announced that the Trust is to or may merge with or into any other trust or consolidate with or into any other trust or corporation (including becoming, by agreement or otherwise, controlled by any person or corporation) (except where the Trust is the surviving entity in a merger) or that it is to, or may, sell or transfer all or substantially all of its assets, the rights attaching to the CBBCs may in the absolute discretion of the Issuer be amended no later than the Business Day preceding the consummation of such merger, consolidation, sale or transfer (each a "**Restructuring Event**") (as determined by the Issuer in its absolute discretion) so that the CBBCs shall, after such Restructuring Event, relate to the number of units of the trust(s) resulting from or surviving such Restructuring Event or other securities ("**Substituted Securities**") and/or cash offered in substitution for the affected Units, as the case may be, to which the holder of such number of Units to which the CBBCs related immediately before such Restructuring Event would have been entitled upon such Restructuring Event, and thereafter the provisions hereof shall apply to such Substituted Securities, provided that any Substituted Securities may, in the absolute discretion of the Issuer, be deemed to be replaced by an amount in the relevant currency equal to the market value or, if no market value is available, fair value, of such Substituted Securities in each case as determined by the Issuer as soon as practicable after such Restructuring Event is effected. For the avoidance of doubt, any remaining Units shall not be affected by this paragraph and, where cash is offered in substitution for Units or is deemed to replace Substituted Securities as described above, references in these Conditions to the Units shall include any such cash.

(E) *Cash Distribution.* No adjustment will be made for an ordinary cash distribution (whether or not it is offered with a scrip alternative) ("**Ordinary Distribution**"). For any other forms of cash distribution ("**Cash Distribution**") announced by the Trust, such as a cash bonus, special distribution or extraordinary distribution, no adjustment will be made unless the value of the Cash Distribution accounts for 2 per cent. or more of the Unit's closing price on the day of announcement by the Trust.

If and whenever the Trust shall make a Cash Distribution credited as fully paid to the holders of Units generally, the Entitlement shall be adjusted to take effect on the Business Day on which trading in the Units becomes ex-entitlement in respect of the Cash Distribution ("**Distribution Adjustment Date**") in accordance with the following formula:

Adjusted Entitlement = Adjustment Component x E

Where:

$$\text{Adjustment Component} = \frac{S - OD}{S - OD - CD}$$

E: The existing Entitlement immediately prior to the Cash Distribution

S: Cum-Cash Distribution Unit price being the closing price of an existing Unit as derived from the Daily Quotation Sheet of the Stock Exchange on the last Business Day on which the Units are traded on a cum-Cash Distribution basis

CD: The Cash Distribution per Unit

OD: The Ordinary Distribution per Unit, provided that the Ordinary Distribution and the Cash Distribution have the same ex-entitlement date. For avoidance of doubt, the OD shall be zero if the Ordinary Distribution and the Cash Distribution have different ex-entitlement dates

In addition, the Issuer shall adjust the Strike Price and/or the Call Price (which shall be rounded to the nearest 0.001) by the reciprocal of the Adjustment Component, where the "**reciprocal of the Adjustment Component**" means one divided by the relevant Adjustment Component. The adjustment to the Strike Price and/or the Call Price shall take effect on the Distribution Adjustment Date.

(F) *Other Adjustments.* Without prejudice to and notwithstanding any prior adjustment(s) made pursuant to the applicable Conditions, the Issuer may (but shall not be obliged to) make such other adjustments to the terms and conditions of the CBBCs as appropriate where any event (including the events as contemplated in the applicable Conditions) occurs and irrespective of, in substitution for, or in addition to the provisions contemplated in the applicable Conditions, provided that such adjustment is:

(i) not materially prejudicial to the interests of the Holders generally (without considering the circumstances of any individual Holder or the tax or other consequences of such adjustment in any particular jurisdiction); or

(ii) determined by the Issuer in good faith to be appropriate and commercially reasonable.

(G) *Notice of Adjustments.* All determinations made by the Issuer pursuant hereto will be conclusive and binding on the Holders. The Issuer will give, or procure that there is given, notice as soon as practicable of any adjustment and of the date from which such adjustment is effective by publication in accordance with Condition 10.

7. Purchase

The Issuer or any of its subsidiaries may at any time purchase CBBCs at any price in the open market or by tender or by private treaty. Any CBBCs so purchased may be held or resold or surrendered for cancellation.

8. Global Certificate

A Global Certificate representing the CBBCs will be deposited with CCASS in the name of HKSCC Nominees Limited. The Global Certificate must be executed manually on behalf of the Issuer by authorised person(s) or attorney(s) of the Issuer.

9. Meetings of Holders and Modification

(A) *Meetings of Holders.* The Instrument contains provisions for convening meetings of the Holders to consider any matter affecting their interests, including the sanctioning by Extraordinary Resolution (as defined in the Instrument) of a modification of the provisions of the CBBCs or of the Instrument.

Any resolution to be passed in a meeting of the Holders shall be decided by poll. A meeting may be convened by the Issuer or by Holders holding not less than 10 per cent. of the CBBCs for the time being remaining unexercised. The quorum at any such meeting for passing an Extraordinary Resolution will be two or more persons holding or representing not less than 25 per cent. of the CBBCs for the time being remaining unexercised, or at any adjourned meeting two or more persons being or representing Holders whatever the number of CBBCs so held or represented.

A resolution will be an Extraordinary Resolution when it has been passed at a duly convened meeting by not less than three-quarters of the votes cast by such Holders who, being entitled to do so, vote in person or by proxy.

An Extraordinary Resolution passed at any meeting of the Holders shall be binding on all the Holders, whether or not they are present at the meeting.

Resolutions can be passed in writing without a meeting of the Holders being held if passed unanimously.

(B) *Modification.* The Issuer may, without the consent of the Holders, effect any modification of the terms and conditions of the CBBCs or the Instrument which, in the opinion of the Issuer, is (i) not materially prejudicial to the interests of the Holders generally (without considering the circumstances of any individual Holder or the tax or other consequences of such modification in any particular jurisdiction); (ii) of a formal, minor or technical nature; (iii) made to correct a manifest error; or (iv) necessary in order to comply with mandatory provisions of the laws or regulations of Hong Kong. Any such modification shall be binding on the Holders and shall be notified to them by the Issuer as soon as practicable thereafter in accordance with Condition 10.

10. Notices

All notices to the Holders will be validly given if published in English and in Chinese on the HKEX website. In such circumstances, the Issuer shall not be required to despatch copies of the notice to the Holders.

11. Termination or Liquidation

In the event of a Termination or the liquidation or dissolution of the trustee of the Trust (including any successor trustee appointed from time to time) ("**Trustee**") (in its capacity as trustee of the Trust) or the appointment of a liquidator, receiver or administrator or analogous person under any applicable law in respect of the whole or substantially the whole of the Trustee's undertaking, property or assets, all unexercised CBBCs will lapse and shall cease to be valid for any purpose. In the case of a Termination, the unexercised CBBCs will lapse and shall cease to be valid on the effective date of the Termination, in the case of a voluntary liquidation, the unexercised CBBCs will lapse and shall cease to be valid on the effective date of the relevant resolution and, in the case of an involuntary liquidation or dissolution, on the date of the relevant court order or, in the case of the appointment of a liquidator or receiver or administrator or analogous person under any applicable law in respect of the whole or substantially the whole of the Trustee's undertaking, property or assets, on the date when such appointment is effective but subject (in any such case) to any contrary mandatory requirement of law.

For the purpose of this Condition 11, "**Termination**" means (i) the Trust is terminated, or the Trustee or the manager of the Trust (including any successor manager appointed from time to time) ("**Manager**") is required to terminate the Trust under the trust deed ("**Trust Deed**") constituting the Trust or applicable law, or the termination of the Trust commences; (ii) the Trust is held or is conceded by the Trustee or the Manager not to be have been constituted or to have been imperfectly constituted; (iii) the Trustee ceases to be authorised under the Trust to hold the property of the Trust in its name and perform its obligations under the Trust Deed; or (iv) the Trust ceases to be authorised as an authorised collective investment scheme under the Securities and Futures Ordinance (Cap. 571 of the Laws of Hong Kong).

12. Further Issues

The Issuer shall be at liberty from time to time, without the consent of the Holders, to create and issue further CBBCs so as to form a single series with the CBBCs.

13. Delisting

(A) If at any time the Units cease to be listed on the Stock Exchange, the Issuer shall give effect to these Conditions in such manner and make such adjustments and amendments to the rights attaching to the CBBCs as it shall, in its absolute discretion, consider appropriate to ensure, so far as it is reasonably able to do so, that the interests of the Holders generally are not materially prejudiced as a consequence of such delisting (without considering the circumstances of any individual Holder or the tax or other consequences that may result in any particular jurisdiction).

(B) Without prejudice to the generality of Condition 13(A), where the Units are, or, upon the delisting, become, listed on any other stock exchange, these Conditions may, in the absolute discretion of the Issuer, be amended to the extent necessary to allow for the substitution of that other stock exchange in place of the Stock Exchange and the Issuer may, without the consent of the Holders, make such adjustments to the entitlements of the Holders on exercise (including, if appropriate, by converting foreign currency amounts at prevailing market rates into the relevant currency) as may be appropriate in the circumstances.

(C) The Issuer shall determine, in its absolute discretion, any adjustment or amendment and its determination shall be conclusive and binding on the Holders save in the case of manifest error. Notice of any adjustments or amendments shall be given to the Holders in accordance with Condition 10 as soon as practicable after they are determined.

14. Good Faith and Commercially Reasonable Manner

Any exercise of discretion by the Issuer under these Conditions will be made in good faith and in a commercially reasonable manner.

15. Governing Law

The CBBCs and the Instrument are governed by and construed in accordance with the laws of the Hong Kong Special Administrative Region of the People's Republic of China ("**Hong Kong**"). The Issuer and each Holder (by its purchase of the CBBCs) submit for all purposes in connection with the CBBCs and the Instrument to the non-exclusive jurisdiction of the courts of Hong Kong.

16. Contracts (Rights of Third Parties) Ordinance

A person who is not a party to these Conditions has no right under the Contracts (Rights of Third Parties) Ordinance (Cap. 623 of the Laws of Hong Kong) to enforce or to enjoy the benefit of any term of the CBBCs.

17. Language

A Chinese translation of these Conditions will be made available for collection during normal office hours from the Sponsor at 52nd Floor, Two International Finance Centre, 8 Finance Street, Central, Hong Kong. In the event of any inconsistency between the Chinese translation and the English version of these Conditions, the English version of these Conditions shall prevail.

18. Prescription

Claims against the Issuer for payment of any amount in respect of the CBBCs will become void unless made within ten years after the MCE Valuation Period or the Expiry Date (as the case may be) and thereafter, any sums payable in respect of such CBBCs shall be forfeited and shall revert to the Issuer.

Sponsor:
UBS Securities Asia Limited
52nd Floor
Two International Finance Centre
8 Finance Street, Central
Hong Kong

APPENDIX 3 — AUDITOR'S REPORT AND OUR CONSOLIDATED FINANCIAL STATEMENTS AS AT AND FOR THE YEAR ENDED 31 DECEMBER 2019

This information in this Appendix 3 has been extracted from the Annual Report 2019 as at and for the year ended 31 December 2019. The page numbers of such document appear on the bottom left or right hand side of the pages in this Appendix 3.

Please refer to the Issuer's base listing document dated 3 April 2019 for the auditor's report and consolidated financial statements as at and for the year ended 31 December 2018.

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To the General Meeting of

UBS AG, Zurich & Basel

Basel, 27 February 2020

Statutory auditor's report on the audit of the consolidated financial statements

Opinion

We have audited the consolidated financial statements of UBS AG and its subsidiaries (the Group), which comprise the consolidated balance sheets as of 31 December 2019 and 31 December 2018, and the consolidated income statements, consolidated statements of comprehensive income, consolidated statements of changes in equity and consolidated statements of cash flows for each of the three years in the period ended 31 December 2019, and notes to the consolidated financial statements, including a summary of significant accounting policies in note 1.

In our opinion, the accompanying consolidated financial statements give a true and fair view of the consolidated financial position of the Group as at 31 December 2019 and 31 December 2018, and the consolidated financial performance and its consolidated cash flows for each of the three years in the period ended 31 December 2019 in accordance with International Financial Reporting Standards (IFRS) and comply with Swiss law.

Basis for opinion

We conducted our audit in accordance with Swiss law, International Standards on Auditing (ISAs) and Swiss Auditing Standards. Our responsibilities under those provisions and standards are further described in the *Auditor's responsibilities for the audit of the consolidated financial statements* section of our report.

We are independent of the Group in accordance with the provisions of Swiss law and the requirements of the Swiss audit profession, as well as the IESBA Code of Ethics for Professional Accountants, and we have fulfilled our other ethical responsibilities in accordance with these requirements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Key audit matters

Key audit matters are those matters that, in our professional judgment, were of most significance in our audit of the consolidated financial statements of the current period. These matters were addressed in the context of our audit of the consolidated financial statements as a whole, and in forming our opinion thereon, and we do not provide a separate opinion on these matters. For each matter below, our description of how our audit addressed the matter is provided in that context.

We have fulfilled the responsibilities described in the *Auditor's responsibilities for the audit of the consolidated financial statements* section of our report, including in relation to these matters. Accordingly, our audit included the performance of procedures designed to respond to our assessment of the risks of material misstatement of the consolidated financial statements. The results of our audit procedures, including the procedures performed to address the matters below, provide the basis for our audit opinion on the accompanying consolidated financial statements.

Valuation of complex or illiquid instruments at fair value in accordance with IFRS 9 and IFRS 13

Area of focus

At 31 December 2019, as explained in notes 1-3f and note 24 to the consolidated financial statements, the Group held financial instruments that did not trade in active markets. These instruments are reported within the following accounts: financial assets and liabilities at fair value held for trading, derivative financial instruments, financial assets and liabilities at fair value not held for trading, and debt issued designated at fair value. In determining the fair value of these financial instruments, the Group used valuation techniques, modelling assumptions, and estimates of unobservable market inputs which required complex and significant judgment.

Auditing management's judgments and assumptions used in the estimation of the fair value of complex or illiquid instruments was complex due to the highly judgmental nature of valuation techniques, modelling assumptions and significant unobservable inputs. Judgmental valuation techniques were comprised of discounted cash flow and earnings-based valuation techniques. Judgmental modelling assumptions result from a range of different models or model calibrations used by market participants. Judgmental valuation inputs include volatility, correlation, credit spreads and bond price equivalent inputs to the valuation of certain financial instruments where there is a limited degree of observability, and where there is judgmental extrapolation or interpolation and calibration of curves using limited data points, as well as judgmental use of proxy data points.

Our audit response

We obtained an understanding, evaluated the design and tested the operating effectiveness of the controls over management's financial instruments valuation processes, including controls over market data inputs into valuation models, model governance, and valuation adjustments.

We tested the valuation techniques, models and methodologies, and the inputs used in those models, as outlined above, by performing an independent revaluation of certain complex or illiquid financial assets and liabilities with the support of a specialist, using independent models and inputs, and comparing inputs to available market data among other procedures.

In addition, we evaluated the methodology and inputs used by management in determining funding and credit fair value adjustments on uncollateralized derivatives and fair value option liabilities.

We also assessed management's disclosures regarding fair value measurement (within notes 1-3f and 24 to the consolidated financial statements).

Recognition of deferred tax assets

Area of focus

At 31 December 2019, the Group's Deferred Tax Assets ("DTA") were USD 9,513 million (see Note 8 to the Group's consolidated financial statements). DTAs are recognized to the extent it is probable that taxable profits will be available, against which, the deductible temporary differences or the carryforward of unused tax losses within the loss carryforward period can be utilized. There is significant judgment exercised when estimating the future taxable income that is not based on the reversal of taxable temporary differences. Management's estimate of future taxable profits is based on the legal entity strategic plans and is sensitive to the assumptions made in estimating future taxable income. Additionally, management supports a portion of the net DTA position with tax planning strategies.

Auditing management's assessment of the realizability of the Group's DTAs was complex due to the highly judgmental nature of estimating future taxable profits over the life of the underlying tax loss carryforwards. Estimating future profitability is inherently subjective and is sensitive to future economic, market and other conditions, which are difficult to predict. Specifically, some of the more subjective macro-economic assumptions used included gross domestic product, equity market performance, and interest rates. Additionally, auditing tax planning strategies requires specific tax knowledge and understanding of the applicable tax laws, which are complex and require judgment in the interpretation of such laws and the related application.

Our audit response

We evaluated the design and tested the operational effectiveness of management's controls over DTA valuation, which included the assumptions used in developing the legal entity strategic plans, tax planning strategies and estimating future taxable income.
We assessed the completeness and accuracy of the data used for the estimations of future taxable income. This included recalculating the outputs of the models applied to the recognition process for DTAs.

We involved specialists to assist in assessing the key economic assumptions embedded in the legal entity strategic plans. We compared key inputs used to forecast future taxable income to externally available historical and prospective data and assumptions; and assessed the sensitivity of the outcomes using reasonably possible changes in assumptions.

In addition, we assessed the appropriateness and impact of management's tax planning strategies by evaluating whether these strategies were reasonable, available, feasible, and prudent. This evaluation was based on applicable tax laws and an assessment of management's interpretations of such tax laws, our understanding of the Group's business and industry, and the Group's ability to implement the strategies.

We also assessed management's disclosure regarding recognized and unrecognized DTAs (within note 8 to the consolidated financial statements).

Legal Provisions & Contingent Liabilities

Area of focus

At 31 December 2019, the Group's provisions for litigation, regulatory and similar matters (legal provisions) were USD 2,475 million. As explained in note 21 to the consolidated financial statements, the Group operates in a legal and regulatory environment that is exposed to significant litigation and similar risks arising from disputes and regulatory proceedings. Such matters are subject to many uncertainties and the outcomes may be difficult to predict. These uncertainties inherently affect the amount and timing of potential outflows with respect to the legal provisions which have been established and contingent liabilities.

Auditing management's assessment of legal provisions and contingent liabilities was complex and judgmental due to the significant estimation required to evaluate management's estimate of the probability that an outflow of resources will be required for existing legal matters. In particular, these legal provisions are based on management's estimation of the likelihood of the occurrence of certain scenarios and related impact on the Group's financial position.

Our audit response

We obtained an understanding, evaluated the design and tested the operational effectiveness of management's controls over the legal provision and contingencies process. Our procedures included testing of management's review of the accuracy of the inputs to the estimation of the likelihood of the occurrence of certain scenarios and related impact on the Group's financial position.

We assessed the methodologies on which the provision amounts were based with the involvement of specialists, recalculated the provisions, and tested the underlying information. We read the legal analyses of the matters supporting the judgmental aspects impacted by legal interpretations. We obtained correspondence directly from external legal counsel to assess the information provided by management and performed inquiries with external counsel as deemed necessary.

We also assessed management's disclosure regarding legal provisions and contingent liabilities (within note 21 to the consolidated financial statements).

Expected Credit Losses

Area of focus

At 31 December 2019, the Group's allowances and provisions for expected credit losses ("ECL") was USD 1,029 million. As explained in note 1-3g, note 10 and note 23 to the consolidated financial statements, ECL is recognized for financial assets measured at amortized cost, financial assets measured at Fair Value Through Other Comprehensive Income, fee and lease receivables, financial guarantees and loan commitments. ECL are also recognized on the undrawn portion of revolving revocable credit lines, which include the Group's credit card limits and master credit facilities. The allowances and provisions for ECL consists of exposures that are in default which are individually evaluated for impairment (stage 3), as well as losses inherent in the loan portfolio that are not specifically identified (stage 1 and stage 2). Management's estimates for ECL represent the difference between contractual cash flows and those the Group expects to receive, discounted at the effective interest rate. The method used to calculate ECL is based on a combination of the following principal factors: probability of default ("PD"), loss given default ("LGD") and exposure at default ("EAD").

Auditing management's estimate of the allowances and provisions for ECL was complex due to the highly judgmental nature of forward-looking economic scenarios, their probability weightings and the credit risk models used to estimate stage 1 and stage 2 ECL.

Auditing the measurement of individual ECL for stage 3 was complex due to the high degree of judgment involved in management's process for estimating ECL based on LGD assumptions. These LGD assumptions take into account expected future cash flows from collateral and other credit enhancements or expected payouts from bankruptcy proceedings for unsecured claims and, where applicable, time to realization of collateral and the seniority of claims.

Our audit response

We obtained an understanding, evaluated the design and tested the operational effectiveness of management's controls over the ECL estimate, including management's choice of, and the probability weighting assigned to, the forward-looking economic scenarios used in measuring ECL. We evaluated management's methodologies and governance controls for developing and monitoring the economic scenarios used and the probability weightings assigned to them. Supported by specialists, we assessed the key macroeconomic variables used in the forward-looking scenarios, such as gross domestic product, unemployment rate, interest rates and house price indexes.

We obtained an understanding, evaluated the design and tested the operating effectiveness of controls, over credit risk models used in the ECL estimate, including controls over the completeness and accuracy of input data for those models, the calculation logic of the models, and the model's output data used in the overall ECL calculation. With the support of specialists, we performed an evaluation of management's models and tested the model outcomes by inspecting model documentation and reperforming model calculations among other procedures.

For the measurement of stage 3, we obtained an understanding, evaluated the design and tested the operating effectiveness of controls over the Group's process, including an evaluation of the assumptions used by management regarding the future cash flows from the debtors' continuing operations and/or the liquidation of collateral. Additionally, we tested collateral valuation, cash flow assumptions and exit strategies, by performing inquiries of management, inspecting underlying documents, such as loan contracts, financial statements, covenants, budgets and business plans, and by re-performing discounted cash flow calculations among other procedures.

We also assessed management's disclosure regarding financial assets at amortized cost and other positions in scope of expected credit loss measurement (note 1-3g, note 10 and note 23 to the consolidated financial statements).

IT access and change management controls relevant to financial reporting

Area of focus	The Group is highly dependent on its IT systems for business processes and financial reporting. The Group continues to invest in its IT systems to meet client needs and business requirements including the effectiveness of its logical access and change management IT controls. Auditing management's IT controls relevant to access and change management was complex as the Group is a multi-location organization and has a significant number of IT systems and applications relevant to financial reporting.
Our audit response	In assessing the reliability of electronic data processing, we included IT auditors as part of our audit team. Our audit procedures focused on the IT infrastructure and applications relevant to financial reporting included obtaining an understanding and evaluating the design and testing of the operating effectiveness of key IT access management, change management, IT operations, and IT automated controls. Our audit procedures related to logical access included tests of user access management, privileged user access, periodic access right recertifications, and user authentication controls. Our audit procedures related to IT change management included tests of management's program change test approach, approval of change requests, as well as segregation of duties.

Other information in the annual report

The Board of Directors is responsible for the other information in the annual report. The other information comprises all information included in the annual report, but does not include the consolidated financial statements, the stand-alone financial statements of UBS AG, the compensation report (pages 284-285), disclosures denoted with an "audited" signpost, and our auditor's reports thereon.

Our opinions on the consolidated financial statements, the standalone financial statements of UBS AG and the compensation report do not cover the other information in the annual report and we do not express any form of assurance conclusion thereon other than the disclosures denoted with an audited "signpost".

In connection with our audit of the consolidated financial statements, our responsibility is to read the other information in the annual report and, in doing so, consider whether the other information is materially inconsistent with the consolidated financial statements or our knowledge obtained in the audit, or otherwise appears to be materially misstated. If, based on the work we have performed, we conclude that there is a material misstatement of this other information, we are required to report that fact. We have nothing to report in this regard.

Responsibility of the Board of Directors for the consolidated financial statements

The Board of Directors is responsible for the preparation of the consolidated financial statements that give a true and fair view in accordance with IFRS and the provisions of Swiss law, and for such internal control as the Board of Directors determines is necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the consolidated financial statements, the Board of Directors is responsible for assessing the Group's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless the Board of Directors either intends to liquidate the Group or to cease operations, or has no realistic alternative but to do so.

Auditor's responsibilities for the audit of the consolidated financial statements

Our objectives are to obtain reasonable assurance about whether the consolidated financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance but is not a guarantee that an audit conducted in accordance with Swiss law, ISAs and Swiss Auditing Standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these consolidated financial statements.

A further description of our responsibilities for the audit of the consolidated financial statements is located at the website of EXPERTsuisse: http://www.expertsuisse.ch/en/audit-report-for-public-companies. This description forms part of our auditor's report.

Report on other legal and regulatory requirements

In accordance with article 728a para. 1 item 3 CO and the Swiss Auditing Standard 890, we confirm that an internal control system exists, which has been designed for the preparation of consolidated financial statements according to the instructions of the Board of Directors.

We recommend that the consolidated financial statements submitted to you be approved.

Ernst & Young Ltd

Marie-Laure Delarue Licensed audit expert (Auditor in charge)	Ira S. Fitlin Certified Public Accountant (U.S.)

UBS AG consolidated financial statements

Primary financial statements

Audited |

Income statement

		For the year ended		
USD million	Note	31.12.19	31.12.18	31.12.17
Interest income from financial instruments measured at amortized cost and fair value through other comprehensive income	3	10,703	10,121	10,437
Interest expense from financial instruments measured at amortized cost	3	(7,303)	(6,494)	(5,468)
Interest income from financial instruments measured at fair value through profit or loss	3	4,718	4,666	2,281
Interest expense from financial instruments measured at fair value through profit or loss	3	(3,703)	(3,322)	(1,228)
Net interest income	3	4,415	4,971	6,021
Other net income from financial instruments measured at fair value through profit or loss	3	6,833	6,953	5,640
Credit loss (expense) / recovery	23	(78)	(117)	(131)
Fee and commission income	4	19,156	19,632	19,390
Fee and commission expense	4	(1,696)	(1,703)	(1,840)
Net fee and commission income	4	17,460	17,930	17,550
Other income	5	677	905	965
Total operating income		29,307	30,642	30,044
Personnel expenses	6	13,801	13,992	14,952
General and administrative expenses	7	8,586	10,075	9,001
Depreciation and impairment of property, equipment and software	15	1,576	1,052	945
Amortization and impairment of goodwill and intangible assets	16	175	65	71
Total operating expenses		24,138	25,184	24,969
Operating profit / (loss) before tax		5,169	5,458	5,076
Tax expense / (benefit)	8	1,198	1,345	4,242
Net profit / (loss)		3,971	4,113	834
Net profit / (loss) attributable to preferred noteholders		0	0	73
Net profit / (loss) attributable to non-controlling interests		6	7	4
Net profit / (loss) attributable to shareholders		3,965	4,107	758

Statement of comprehensive income

	For the year ended		
USD million	31.12.19	31.12.18	31.12.17
Comprehensive income attributable to shareholders			
Net profit / (loss)	3,965	4,107	758
Other comprehensive income that may be reclassified to the income statement			
Foreign currency translation			
Foreign currency translation movements related to net assets of foreign operations, before tax	199	(701)	1,553
Effective portion of changes in fair value of hedging instruments designated as net investment hedges, before tax	(144)	181	(55)
Foreign currency translation differences on foreign operations reclassified to the income statement	52	4	32
Effective portion of changes in fair value of hedging instruments designated as net investment hedges reclassified to the income statement	(14)	2	(6)
Income tax relating to foreign currency translations, including the effect of net investment hedges	(1)	(2)	(2)
Subtotal foreign currency translation, net of tax	92	(515)	1,522
Financial assets measured at fair value through other comprehensive income			
Net unrealized gains / (losses), before tax	189	(56)	96
Impairment charges reclassified to the income statement from equity	0	0	15
Realized gains reclassified to the income statement from equity	(33)	0	(209)
Realized losses reclassified to the income statement from equity	2	0	14
Income tax relating to net unrealized gains / (losses)	(41)	12	(6)
Subtotal financial assets measured at fair value through other comprehensive income, net of tax	117	(45)	(91)
Cash flow hedges of interest rate risk			
Effective portion of changes in fair value of derivative instruments designated as cash flow hedges, before tax	1,571	(42)	45
Net (gains) / losses reclassified to the income statement from equity	(175)	(294)	(843)
Income tax relating to cash flow hedges	(253)	67	163
Subtotal cash flow hedges, net of tax	1,143	(269)	(635)
Total other comprehensive income that may be reclassified to the income statement, net of tax	1,351	(829)	797
Other comprehensive income that will not be reclassified to the income statement			
Defined benefit plans			
Gains / (losses) on defined benefit plans, before tax	(129)	(70)	308
Income tax relating to defined benefit plans	(41)	245	6
Subtotal defined benefit plans, net of tax	(170)	175	314
Own credit on financial liabilities designated at fair value			
Gains / (losses) from own credit on financial liabilities designated at fair value, before tax	(400)	517	(315)
Income tax relating to own credit on financial liabilities designated at fair value	8	(8)	(2)
Subtotal own credit on financial liabilities designated at fair value, net of tax	(392)	509	(317)
Total other comprehensive income that will not be reclassified to the income statement, net of tax	(562)	684	(3)
Total other comprehensive income	789	(145)	794
Total comprehensive income attributable to shareholders	4,754	3,961	1,552

Table continues on the next page.

Statement of comprehensive income (continued)

Table continued from previous page.

	For the year ended		
USD million	31.12.19	31.12.18	31.12.17
Comprehensive income attributable to preferred noteholders			
Net profit / (loss)	0	0	73
Other comprehensive income that will not be reclassified to the income statement			
Foreign currency translation movements, before tax	0	0	247
Income tax relating to foreign currency translation movements	0	0	0
Subtotal foreign currency translation, net of tax	0	0	247
Total other comprehensive income that will not be reclassified to the income statement, net of tax	0	0	247
Total comprehensive income attributable to preferred noteholders	0	0	320
Comprehensive income attributable to non-controlling interests			
Net profit / (loss)	6	7	4
Other comprehensive income that will not be reclassified to the income statement			
Foreign currency translation movements, before tax	(4)	(1)	2
Income tax relating to foreign currency translation movements	0	0	0
Subtotal foreign currency translation, net of tax	(4)	(1)	2
Total other comprehensive income that will not be reclassified to the income statement, net of tax	(4)	(1)	2
Total comprehensive income attributable to non-controlling interests	2	5	6
Total comprehensive income			
Net profit / (loss)	3,971	4,113	834
Other comprehensive income	785	(147)	1,044
of which: other comprehensive income that may be reclassified to the income statement	*1,351*	*(829)*	*797*
of which: other comprehensive income that will not be reclassified to the income statement	*(566)*	*682*	*247*
Total comprehensive income	4,756	3,967	1,878

Balance sheet

USD million	Note	31.12.19	31.12.18
Assets			
Cash and balances at central banks		107,068	108,370
Loans and advances to banks	10	12,379	16,642
Receivables from securities financing transactions	10, 25	84,245	95,349
Cash collateral receivables on derivative instruments	10, 25	23,289	23,603
Loans and advances to customers	10	327,992	321,482
Other financial assets measured at amortized cost	10, 17a	23,012	22,637
Total financial assets measured at amortized cost		577,985	588,084
Financial assets at fair value held for trading	12, 24	127,695	104,513
of which: assets pledged as collateral that may be sold or repledged by counterparties		*41,285*	*32,121*
Derivative financial instruments	11, 24, 25	121,843	126,212
Brokerage receivables	24	18,007	16,840
Financial assets at fair value not held for trading	13, 24	83,636	82,387
Total financial assets measured at fair value through profit or loss		351,181	329,953
Financial assets measured at fair value through other comprehensive income	14, 24	6,345	6,667
Investments in associates	31b	1,051	1,099
Property, equipment and software	15	11,826	8,479
Goodwill and intangible assets	16	6,469	6,647
Deferred tax assets	8	9,513	10,066
Other non-financial assets	17b	7,547	7,062
Total assets		971,916	958,055
Liabilities			
Amounts due to banks	18	6,570	10,962
Payables from securities financing transactions	25	7,778	10,296
Cash collateral payables on derivative instruments	25	31,416	28,906
Customer deposits	18a	450,591	421,986
Funding from UBS Group AG and its subsidiaries	18b	47,866	41,202
Debt issued measured at amortized cost	20	62,835	91,245
Other financial liabilities measured at amortized cost	22a	10,373	7,576
Total financial liabilities measured at amortized cost		617,429	612,174
Financial liabilities at fair value held for trading	12, 24	30,591	28,949
Derivative financial instruments	11, 24, 25	120,880	125,723
Brokerage payables designated at fair value	24	37,233	38,420
Debt issued designated at fair value	19, 24	66,592	57,031
Other financial liabilities designated at fair value	22b, 24	36,157	33,594
Total financial liabilities measured at fair value through profit or loss		291,452	283,717
Provisions	21a	2,938	3,457
Other non-financial liabilities	22c	6,168	6,275
Total liabilities		917,988	905,624
Equity			
Share capital		338	338
Share premium		24,659	24,655
Retained earnings		23,451	23,317
Other comprehensive income recognized directly in equity, net of tax		5,306	3,946
Equity attributable to shareholders		53,754	52,256
Equity attributable to non-controlling interests		174	176
Total equity		53,928	52,432
Total liabilities and equity		971,916	958,055

Statement of changes in equity

USD million	Share capital	Share premium	Retained earnings
Balance as of 1 January 2017	**338**	**27,154**	**21,480**
Issuance of share capital			
Premium on shares issued and warrants exercised		6	
Tax (expense) / benefit		16	
Dividends		(2,219)	
Preferred notes			
Translation effects recognized directly in retained earnings			(46)
New consolidations / (deconsolidations) and other increases / (decreases)		(324)	
Total comprehensive income for the year			755
of which: net profit / (loss)			*758*
of which: other comprehensive income (OCI) that may be reclassified to the income statement, net of tax			
of which: OCI that will not be reclassified to the income statement, net of tax – defined benefit plans			*314*
of which: OCI that will not be reclassified to the income statement, net of tax – own credit			*(317)*
of which: OCI that will not be reclassified to the income statement, net of tax – foreign currency translation			
Balance as of 31 December 2017	**338**	**24,633**	**22,189**
Effect of adoption of IFRS 9			(518)
Effect of adoption of IFRS 15			(25)
Balance as of 1 January 2018 after the adoption of IFRS 9 and IFRS 15	**338**	**24,633**	**21,646**
Issuance of share capital			
Premium on shares issued and warrants exercised		34	
Tax (expense) / benefit		(5)	
Dividends			(3,098)
Translation effects recognized directly in retained earnings			(21)
New consolidations / (deconsolidations) and other increases / (decreases)		(7)	
Total comprehensive income for the year			4,790
of which: net profit / (loss)			*4,107*
of which: other comprehensive income (OCI) that may be reclassified to the income statement, net of tax			
of which: OCI that will not be reclassified to the income statement, net of tax – defined benefit plans			*175*
of which: OCI that will not be reclassified to the income statement, net of tax – own credit			*509*
of which: OCI that will not be reclassified to the income statement, net of tax – foreign currency translation			
Balance as of 31 December 2018	**338**	**24,655**	**23,317**

	Other comprehensive income recognized directly in equity, net of tax[1]	*of which: foreign currency translation*	*of which: financial assets at fair value through other comprehensive income*	*of which: cash flow hedges*	Total equity attributable to shareholders	Preferred noteholders	Non-controlling interests	Total equity
	3,985	***2,933***	***96***	***955***	**52,957**	**631**	**39**	**53,627**
					0			0
					6			6
					16			16
					(2,219)	(73)	(4)	(2,297)
					0	(878)		(878)
	46		*7*	*39*	0			0
					(324)		18	(306)
	797	*1,522*	*(91)*	*(635)*	1,552	320	6	1,878
					758	*73*	*4*	*834*
	797	*1,522*	*(91)*	*(635)*	*797*			*797*
					314			*314*
					(317)			*(317)*
					0	*247*	*2*	*250*
	4,828	***4,455***	***13***	***360***	**51,987**	**0**	**59**	**52,046**
	(74)		*(74)*		(591)			(591)
					(25)			(25)
	4,754	***4,455***	***(61)***	***360***	**51,370**	**0**	**59**	**51,429**
					0			0
					34			34
					(5)			(5)
					(3,098)		(10)	(3,108)
	21		*3*	*18*	0			0
					(7)		122	115
	(829)	*(515)*	*(45)*	*(269)*	3,961	0	5	3,967
					4,107		*7*	*4,113*
	(829)	*(515)*	*(45)*	*(269)*	*(829)*			*(829)*
					175			*175*
					509			*509*
					0		*(1)*	*(1)*
	3,946	**3,940**	***(103)***	***109***	**52,256**	**0**	**176**	**52,432**

Statement of changes in equity (continued)

USD million	Share capital	Share premium	Retained earnings
Balance as of 31 December 2018	**338**	**24,655**	**23,317**
Effect of adoption of IFRIC 23			(11)
Balance as of 1 January 2019 after the adoption of IFRIC 23	**338**	**24,655**	**23,306**
Issuance of share capital			
Premium on shares issued and warrants exercised		0	
Tax (expense) / benefit		11	
Dividends			(3,250)
Translation effects recognized directly in retained earnings			(9)
New consolidations / (deconsolidations) and other increases / (decreases)		(7)	
Total comprehensive income for the year			3,403
of which: net profit / (loss)			*3,965*
of which: other comprehensive income (OCI) that may be reclassified to the income statement, net of tax			
of which: OCI that will not be reclassified to the income statement, net of tax – defined benefit plans			*(170)*
of which: OCI that will not be reclassified to the income statement, net of tax – own credit			*(392)*
of which: OCI that will not be reclassified to the income statement, net of tax – foreign currency translation			
Balance as of 31 December 2019	338	24,659	23,451

1 Excludes defined benefit plans and own credit that are recorded directly in Retained earnings.

Other comprehensive income recognized directly in equity, net of tax[1]	*of which: foreign currency translation*	*of which: financial assets at fair value through other comprehensive income*	*of which: cash flow hedges*	Total equity attributable to shareholders	Preferred noteholders	Non-controlling interests	Total equity
3,946	*3,940*	*(103)*	*109*	52,256	0	176	52,432
				(11)			(11)
3,946	*3,940*	*(103)*	*109*	52,245	0	176	52,421
				0			0
				0			0
				11			11
				(3,250)		(8)	(3,258)
9		*0*	*9*	0			0
				(7)		5	(3)
1,351	*92*	*117*	*1,143*	4,754	0	2	4,756
				3,965		*6*	*3,971*
1,351	*92*	*117*	*1,143*	*1,351*			*1,351*
				(170)			*(170)*
				(392)			*(392)*
				0		*(4)*	*(4)*
5,306	*4,032*	*14*	*1,260*	53,754	0	174	53,928

UBS AG shares issued

As of 31 December 2019, shares issued by UBS AG totaled 3,858,408,466 (31 December 2018: 3,858,408,466 shares) and were entirely held by UBS Group AG.

Conditional share capital

Conditional capital up to a maximum of CHF 38,000,000, represented by up to 380,000,000 fully paid registered shares with a nominal value of CHF 0.10 each, was available as of 31 December 2019 for conversion rights and warrants granted in connection with the issuance of bonds or similar financial instruments.

Authorized share capital

UBS AG had no authorized capital available to issue on 31 December 2019.

Statement of cash flows

	For the year ended		
USD million	31.12.19	31.12.18	31.12.17
Cash flow from / (used in) operating activities			
Net profit / (loss)	3,971	4,113	834
Non-cash items included in net profit and other adjustments:			
Depreciation and impairment of property, equipment and software	1,576	1,052	945
Impairment of goodwill	110	0	0
Amortization and impairment of intangible assets	65	65	71
Credit loss expense / (recovery)	78	117	131
Share of net profits of associates / joint ventures and impairment of associates	(45)	(528)	(69)
Deferred tax expense / (benefit)	460	374	3,398
Net loss / (gain) from investing activities	220	(49)	(198)
Net loss / (gain) from financing activities	6,506	(4,829)	2,763
Other net adjustments	862	(1,092)	(1,077)
Net change in operating assets and liabilities:			
Loans and advances to banks / amounts due to banks	(4,336)	3,504	(3,236)
Securities financing transactions	8,678	(11,230)	(111)
Cash collateral on derivative instruments	2,842	(1,449)	(2,454)
Loans and advances to customers	(3,205)	(4,152)	(15,661)
Customer deposits	23,399	7,931	(12,073)
Financial assets and liabilities at fair value held for trading and derivative financial instruments	(18,873)	11,093	(23,560)
Brokerage receivables and payables	(2,347)	11,432	
Financial assets at fair value not held for trading, other financial assets and liabilities	126	10,902	(1,801)
Provisions, other non-financial assets and liabilities	(537)	1,377	(29)
Income taxes paid, net of refunds	(741)	(888)	(1,021)
Net cash flow from / (used in) operating activities	18,805	27,744	(53,147)
Cash flow from / (used in) investing activities			
Purchase of subsidiaries, associates and intangible assets	(26)	(287)	(106)
Disposal of subsidiaries, associates and intangible assets[1]	114	137	339
Purchase of property, equipment and software	(1,401)	(1,473)	(1,532)
Disposal of property, equipment and software	11	114	210
Purchase of financial assets measured at fair value through other comprehensive income	(3,424)	(1,999)	(8,626)
Disposal and redemption of financial assets measured at fair value through other comprehensive income	3,913	1,361	15,250
Net (purchase) / redemption of debt securities measured at amortized cost	(562)	(3,770)	
Net (purchase) / redemption of financial assets held to maturity			(91)
Net cash flow from / (used in) investing activities	(1,374)	(5,918)	5,444

Table continues on the next page.

Financial statements

Statement of cash flows (continued)

Table continued from previous page.

	For the year ended		
USD million	31.12.19	31.12.18	31.12.17
Cash flow from / (used in) financing activities			
Net short-term debt issued / (repaid)	(17,149)	(12,245)	24,500
Distributions paid on UBS shares	(3,250)	(3,098)	(2,219)
Repayment of lease liabilities[2]	(496)		
Issuance of long-term debt, including debt issued designated at fair value	59,199	54,726	40,270
Repayment of long-term debt, including debt issued designated at fair value	(68,883)	(44,344)	(45,187)
Funding from UBS Group AG and its subsidiaries	5,848	5,956	11,180
Dividends paid and repayments of preferred notes			(782)
Net changes in non-controlling interests	(8)	(31)	(5)
Net cash flow from / (used in) financing activities	(24,738)	963	27,758
Total cash flow			
Cash and cash equivalents at the beginning of the year	125,853	104,787	118,984
Net cash flow from / (used in) operating, investing and financing activities	(7,307)	22,789	(19,944)
Effects of exchange rate differences on cash and cash equivalents	1,258	(1,722)	5,749
Cash and cash equivalents at the end of the year[3]	119,804	125,853	104,787
of which: cash and balances at central banks[4]	*106,957*	*108,268*	*89,968*
of which: loans and advances to banks	*11,317*	*15,452*	*12,726*
of which: money market paper[5]	*1,530*	*2,133*	*2,093*
Additional information			
Net cash flow from / (used in) operating activities includes:			
Interest received in cash[6]	15,344	14,666	12,721
Interest paid in cash[6]	10,800	9,372	6,748
Dividends on equity investments, investment funds and associates received in cash[7]	3,145	2,322	1,828

1 Includes dividends received from associates. 2 Upon adoption of IFRS 16 on 1 January 2019, cash payments for the principal portion of the lease liability previously classified within operating activities have been reclassified to financing activities. 3 USD 3,192 million, USD 5,245 million and USD 2,497 million of cash and cash equivalents (mainly reflected in Loans and advances to banks) were restricted as of 31 December 2019, 31 December 2018 and 31 December 2017, respectively. Refer to "Note 26 Restricted and transferred financial assets" in the "Consolidated financial statements" section of the Annual Report 2019 for more information. 4 Includes only balances with an original maturity of three months or less. 5 Money market paper is included in the balance sheet under Financial assets at fair value held for trading (31 December 2019: USD 235 million; 31 December 2018: USD 366 million; 31 December 2017: USD 135 million), Financial assets measured at fair value through other comprehensive income (31 December 2019: USD 24 million; 31 December 2018: USD 8 million; 31 December 2017: USD 17 million), Financial assets at fair value not held for trading (31 December 2019: USD 920 million; 31 December 2018: USD 1,556 million; 31 December 2017: USD 1,941 million) and Other financial assets measured at amortized cost (31 December 2019: USD 351 million; 31 December 2018: USD 204 million; 31 December 2017: USD 0 million). 6 Interest received and paid in cash was restated to represent the total of interest on financial instruments measured at amortized cost / fair value through other comprehensive income (31 December 2018: USD 10,013 million interest received and USD 6,549 million interest paid and 31 December 2017: USD 10,469 million interest received and USD 5,485 million interest paid) and interest on financial instruments measured at fair value through profit or loss (31 December 2018: USD 4,653 million interest received and USD 2,823 million interest paid and 31 December 2017: USD 2,252 million interest received and USD 1,264 million interest paid). 7 Includes dividends received from associates reported within Net cash flow from / (used in) investing activities.

Changes in liabilities arising from financing activities

USD million	Debt issued measured at amortized cost	*of which: short-term*	*of which: long-term*	Debt issued designated at fair value	Over-the-counter (OTC) debt instruments[2]	Funding from UBS Group AG and its subsidiaries[3]	Total
Balance as of 1 January 2018	107,458	*52,270*	*55,187*	50,782	4,428	35,648	198,316
Cash flows	(13,358)	*(12,245)*	*(1,113)*	13,332	(1,838)	5,956	4,092
Non-cash changes	(2,855)	*(1,000)*	*(1,854)*	(7,083)	(140)	(402)	(10,481)
of which: foreign currency translation	*(2,624)*	*(1,000)*	*(1,623)*	*309*	*(59)*	*(289)*	*(2,663)*
of which: fair value changes				*(7,392)*	*(82)*	*0*	*(7,475)*
of which: other	*(231)*	*0*	*(231)[1]*	*0*	*0*	*(113)[1]*	*(344)*
Balance as of 31 December 2018	91,245	*39,025*	*52,220*	57,031	2,450	41,202	191,928
Cash flows	(28,355)	*(17,149)*	*(11,206)*	1,947	(425)	5,848	(20,985)
Non-cash changes	(55)	*(39)*	*(16)*	7,614	(3)	1,033	8,588
of which: foreign currency translation	*(346)*	*(39)*	*(307)*	*210*	*(6)*	*(128)*	*(270)*
of which: fair value changes				*7,404*	*3*	*17*	*7,424*
of which: other	*291*	*0*	*291[1]*	*0*	*0*	*1,144[1]*	*1,434*
Balance as of 31 December 2019	62,835	*21,837*	*40,998*	66,592	2,022	48,083	179,531

1 Includes the effect of fair value hedges on long-term debt. Refer to Note 1a item j and Note 20 for more information. 2 Included in balance sheet line Other financial liabilities designated at fair value. 3 Includes funding from UBS Group AG and its subsidiaries measured at amortized cost (refer to Note 18b Funding from UBS Group AG and its subsidiaries) and measured at fair value (refer to Note 22b Other financial liabilities designated at fair value).

Financial statements

Notes to the UBS AG consolidated financial statements

Note 1 Summary of significant accounting policies

The following table provides an overview of information included in this Note.

Accounting policies applicable to prior periods

The accounting policies described in Note 1a have been applied consistently in 2019, 2018 and 2017 unless otherwise stated in Note 1b. Exceptions include IFRS 9, *Financial Instruments* (effective from 1 January 2018), IFRS 15, *Revenue from Contracts with Customers* (effective from 1 January 2018), and IFRS 16, *Leases* (effective from 1 January 2019).

Within Note 1a, policies applied in 2018 and 2017, or only in 2017 that differ from those applied to the financial year ended 31 December 2019 are identified with a **Comparative policy** | signpost. A triangle symbol – ▲ – indicates the end of these comparative policy sections.

a) Significant accounting policies

This Note describes the significant accounting policies applied in the preparation of the consolidated financial statements (the Financial Statements) of UBS AG and its subsidiaries (UBS AG). On 27 February 2020, the Financial Statements were authorized for issue by the Board of Directors.

Basis of accounting

The Financial Statements have been prepared in accordance with International Financial Reporting Standards (IFRS), as issued by the International Accounting Standards Board (IASB), and are presented in US dollars (USD), which is also the functional currency of: UBS AG's Head Office; UBS AG, London Branch; and UBS AG's US-based operations.

Disclosures provided in the "Risk, treasury and capital management" section of this report that are marked as audited form an integral part of the Financial Statements. These disclosures relate to requirements under IFRS 7, *Financial Instruments: Disclosures,* and IAS 1, *Presentation of Financial Statements,* and are not repeated in this section.

The accounting policies described in this Note have been applied consistently in 2019, 2018 and 2017 unless otherwise stated in Note 1b. Exceptions include IFRS 9, *Financial Instruments* (effective from 1 January 2018), IFRS 15, *Revenue from Contracts with Customers* (effective from 1 January 2018), and IFRS 16, *Leases* (effective from 1 January 2019). Within this Note, policies applied in 2018 and 2017 or only in 2017 that differ from those applied to the financial year ended 31 December 2019 are identified as "Comparative policy."

Critical accounting estimates and judgments

Preparation of these Financial Statements under IFRS requires management to apply judgment and make estimates and assumptions that affect reported amounts of assets, liabilities, income and expenses and disclosure of contingent assets and liabilities, and may involve significant uncertainty at the time they are made. Such estimates and assumptions are based on the best available information. UBS AG regularly reassesses the estimates and assumptions, which encompass historical experience, expectations of the future and other pertinent factors, to determine their continuing relevance based on current conditions, updating them as necessary. Changes in those estimates and assumptions may have a significant effect on the Financial Statements. Furthermore, actual results may differ significantly from UBS AG's estimates, which could result in significant losses to UBS AG, beyond what was anticipated or provided for.

The following areas contain estimation uncertainty or require critical judgment and have a significant effect on the amounts recognized in the Financial Statements:
- fair value measurement (refer to item 3f in this Note and to Note 24);
- expected credit loss measurement (refer to item 3g in this Note and to Note 23);
- assessment of the business model and certain contractual features when classifying financial instruments (refer to item 3b in this Note);
- pension and other post-employment benefit plans (refer to item 7 in this Note and to Note 29);
- income taxes (refer to item 8 in this Note and to Note 8);
- goodwill (refer to item 11 in this Note and to Note 16);
- provisions and contingent liabilities (refer to item 12 in this Note and to Note 21);
- consolidation of structured entities (refer to item 1 in this Note and to Note 31); and
- determination of the functional currency and assessing the earliest date from which it is practical to perform a restatement following a change in presentational currency for the year ended 31 December 2018 (refer to item 13 in this Note).

1) Consolidation

a. Consolidation principles

The Financial Statements comprise the financial statements of UBS AG and its subsidiaries, presented as a single economic entity, whereby intercompany transactions and balances have been eliminated. UBS AG consolidates all entities that it controls, including controlled structured entities (SEs), which is the case when it has: (i) power over the relevant activities of the entity; (ii) exposure to an entity's variable returns; and (iii) the ability to use its power to affect its own returns.

Where an entity is governed by voting rights, control is generally indicated by a direct shareholding of more than one-half of the voting rights.

Note 1 Summary of significant accounting policies (continued)

In other cases, the assessment of control is more complex and requires greater use of judgment. Where UBS AG has an interest in an entity that exposes it to variability, UBS AG considers whether it has power over the relevant activities of the entity that allows it to affect the variability of its returns. Consideration is given to all facts and circumstances to determine whether UBS AG has power over another entity, i.e., the current ability to direct the relevant activities of an entity when decisions about those activities need to be made. Factors such as the purpose and design of the entity, rights held through contractual arrangements (such as call rights, put rights or liquidation rights) as well as potential decision-making rights are all considered in this assessment. Where UBS AG has power over the relevant activities, a further assessment is made to determine whether, through that power, it has the ability to affect its own returns by assessing whether power is held in a principal or agent capacity. Consideration is given to: (i) the scope of decision-making authority; (ii) rights held by other parties, including removal or other participating rights; and (iii) exposure to variability, including remuneration, relative to total variability of the entity, as well as whether that exposure is different from that of other investors. If, after reviewing these factors, UBS AG concludes that it can exercise its power to affect its own returns, the entity is consolidated.

Subsidiaries, including SEs, are consolidated from the date when control is obtained and are deconsolidated from the date when control ceases. Control, or the lack thereof, is reassessed if facts and circumstances indicate that there is a change to one or more of the elements required to establish that control is present.

→ **Refer to Note 31 for more information**

b. Structured entities

UBS AG sponsors the formation of SEs and interacts with non-sponsored SEs for a variety of reasons, including allowing clients to obtain or be exposed to particular risk profiles, to provide funding or to sell or purchase credit risk. An SE is an entity that has been designed so that voting or similar rights are not the dominant factor in deciding who controls the entity. Such entities generally have a narrow and well-defined objective and include those historically referred to as special-purpose entities, as well as some investment funds. UBS AG assesses whether an entity is an SE by considering the nature of the activities of the entity as well as the substance of voting or similar rights afforded to other parties, including investors and independent boards or directors. UBS AG considers rights such as the ability to liquidate the entity or remove the decision maker to be similar to voting rights when the holder has the substantive ability to exercise such rights without cause. In the absence of such rights or in cases where the existence of such rights cannot be fully established, the entity is considered to be an SE.

The classes of SEs with which UBS AG is involved include the following:

- *Securitization structured entities* are established to issue securities to investors that are backed by assets held by the SE and whereby (i) significant credit risk associated with the securitized exposures has been transferred to third parties and (ii) there is more than one risk position or tranche issued by the securitization vehicle in line with the Basel III securitization definition. All securitization entities are classified as SEs.
- *Client investment structured entities* are established predominantly for clients to invest in specific assets or risk exposures through purchasing notes issued by the SE, predominantly on a fixed-term basis. The SE may source assets via a transfer from UBS AG or through an external market transaction. In some cases, UBS AG may enter into derivatives with the SE to either align the cash flows of the entity with the investor's intended investment objective or to introduce other desired risk exposures. In certain cases, UBS AG may have interests in a third-party-sponsored SE to hedge specific risks or participate in asset-backed financing.
- *Investment fund structured entities* have a collective investment objective, are managed by an investment manager and are either passively managed, so that any decision making does not have a substantive effect on variability, or are actively managed, and investors or their governing bodies do not have substantive voting or similar rights. UBS AG creates and sponsors a large number of funds in which it may have an interest through the receipt of variable management fees and/or a direct investment. In addition, UBS AG has interests in a number of funds created and sponsored by third parties, including exchange-traded funds and hedge funds, to hedge issued structured products.

When UBS AG does not consolidate an SE, but has an interest in an SE or has sponsored an SE, disclosures are provided on the nature of these interests and sponsorship activities.

Critical accounting estimates and judgments

Each individual entity is assessed for consolidation in line with the aforementioned consolidation principles. The assessment of control can be complex and requires the use of significant judgment. As the nature and extent of UBS AG's involvement are unique to each entity, there is no uniform consolidation outcome by entity. Certain entities within a class may be consolidated while others may not. When carrying out the consolidation assessment, judgment is exercised considering all the relevant facts and circumstances, including the nature and activities of the investee, as well as the substance of voting and similar rights.

→ **Refer to Note 31 for more information**

2) Segment reporting

UBS AG's businesses are organized globally into four business divisions: Global Wealth Management, Personal & Corporate Banking, Asset Management and the Investment Bank. All four business divisions are supported by Corporate Center and qualify as reportable segments for the purpose of segment reporting. Together with Corporate Center, the four business divisions reflect the management structure of the Group. Financial information about the four business divisions and Corporate Center is presented separately in internal management reports.

Prior to 2018, UBS AG's businesses were organized globally into five business divisions: Wealth Management, Wealth Management Americas, Personal & Corporate Banking, Asset Management and the Investment Bank, all of which were supported by Corporate Center. The five business divisions qualified as reportable segments for the purpose of segment reporting and, together with Corporate Center, reflected the management structure of the Group. Corporate Center – Non-core and Legacy Portfolio was managed and reported as a separate reportable unit within Corporate Center. Financial information about the five business divisions and Corporate Center was presented separately in internal management reports.

Effective from 2018, UBS AG combined its Wealth Management and Wealth Management Americas business divisions into a single Global Wealth Management business division. Global Wealth Management is managed on an integrated basis, with a single set of performance targets and an integrated operating plan and management structure. Consistent with this, the operating results of Global Wealth Management are presented and assessed on an integrated basis in internal management reports. Consequently, from 2018, Global Wealth Management qualifies as an operating and reportable segment for the purposes of segment reporting and is presented in these Financial Statements alongside Personal & Corporate Banking, Asset Management, the Investment Bank and Corporate Center. Following the change in the composition of UBS AG's operating segments and corresponding reportable segments, previously reported segment information has been restated. This change had no material effect on the former segments, including recognized goodwill.

→ **Refer to item 11 in this Note and Note 16 for more information**

Effective from 2019, UBS AG has operationally combined Group Treasury activities with Group Asset and Liability Management (Group ALM) and calls this combined unit Group Treasury. In addition, UBS AG provides results for total Corporate Center only and does not separately report Corporate Center – Services, Group Treasury and Non-core and Legacy Portfolio due to the substantial reduction in the size and resource consumption of these units. Prior-period information has been restated.

UBS AG's internal accounting policies, which include management accounting policies and service level agreements, determine the revenues and expenses directly attributable to each reportable segment. Transactions between the reportable segments are carried out at internally agreed rates and are reflected in the operating results of the reportable segments. Revenue-sharing agreements are used to allocate external client revenues to reportable segments where several reportable segments are involved in the value creation chain. Commissions are credited to the reportable segments based on the corresponding client relationship. Total intersegment revenues for UBS AG are immaterial, as the majority of the revenues are allocated across the segments by means of revenue-sharing agreements. Interest income earned from managing UBS AG's consolidated equity is allocated to the reportable segments based on average attributed tangible equity and currency composition. Assets and liabilities of the reportable segments are funded through and invested with Corporate Center, and the net interest margin is reflected in the results of each reportable segment.

Note 1 Summary of significant accounting policies (continued)

Segment assets are based on a third-party view and do not include intercompany balances. This view is in line with internal reporting to management. Certain assets managed centrally by Corporate Center may be allocated to other segments on a basis different to that on which the corresponding costs or revenues are allocated. For example, certain assets are reported on the balance sheet of Corporate Center, notwithstanding that the costs or revenues associated with these assets may be entirely or partly allocated to the operating segments. Similarly, certain assets are reported in the business divisions, whereas the corresponding costs or revenues are entirely or partly allocated to Corporate Center.

Non-current assets disclosed for segment reporting purposes represent assets that are expected to be recovered more than 12 months after the reporting date, excluding financial instruments, deferred tax assets and post-employment benefits.

→ **Refer to Notes 1b and 2 for more information**

3) Financial instruments

a. Recognition

UBS AG recognizes financial instruments when it becomes a party to the contractual provisions of the instrument. UBS AG applies settlement date accounting to all regular way purchases and sales of non-derivative financial instruments.

In transactions in which UBS AG acts as a transferee, to the extent that the transfer of a financial asset does not qualify for derecognition by the transferor, UBS AG does not recognize the transferred instrument as its asset.

UBS AG also acts in a fiduciary capacity, which results in the holding or placing of assets on behalf of individuals, trusts, retirement benefit plans and other institutions. Unless these items meet the definition of an asset and the recognition criteria are satisfied, such assets are not recognized on UBS AG's balance sheet. Consequently, the related income is excluded from these Financial Statements.

Client cash balances associated with derivatives clearing and execution services are not recognized on the balance sheet if, through contractual agreement, regulation or practice, UBS AG neither obtains benefits from nor controls the client cash balances.

b. Classification, measurement and presentation

All financial instruments are on initial recognition measured at fair value. In the case of financial instruments subsequently measured at amortized cost or fair value through other comprehensive income (FVOCI), the initial fair value is adjusted for directly attributable transaction costs.

Policy applicable from 1 January 2018[1]

On initial recognition, financial assets are classified as measured at amortized cost, FVOCI or fair value through profit or loss (FVTPL).

A debt instrument is measured at amortized cost if it meets both of the following conditions:

– it is held within a business model that has an objective to hold financial assets to collect contractual cash flows; and
– the contractual terms of the financial asset result in cash flows that are solely payments of principal and interest (SPPI) on the principal amount outstanding.

A debt instrument is measured at FVOCI if it meets both of the following conditions:

– it is held within a business model whose objective is achieved by both collecting contractual cash flows and selling financial assets; and
– the contractual terms of the financial asset result in cash flows that are SPPI on the principal amount outstanding.

All other financial assets are measured at FVTPL and consist of held for trading assets, assets mandatorily measured on a fair value basis and derivatives, except to the extent that they are designated in a hedging relationship, in which case the IAS 39 hedge accounting requirements continue to apply.

Business model assessment

UBS AG determines the nature of the business model, for example if the objective is to hold the financial asset and collect the contractual cash flows, by considering the way in which the financial assets are managed to achieve a particular business objective as determined by management.

Financial assets that are held for trading or managed on a fair value basis are measured at FVTPL insofar as the associated business model is neither to hold the financial assets to collect contractual cash flows nor to hold to collect contractual cash flows and sell.

UBS AG originates loans to hold to maturity and to sell or sub-participate to other parties, resulting in a transfer of substantially all the risks and rewards, and derecognition of the loan or portions of it. UBS AG considers the activities of lending to hold and lending to sell or sub-participate as two separate business models, with financial assets within the former considered to be within a business model that has an objective of holding assets to collect contractual cash flows, and those within the latter included in a trading portfolio. In certain cases, it may not be possible on origination to identify whether loans or portions of loans will be sold or sub-participated and certain loans may be managed on a fair value basis through, for instance, using credit derivatives. These financial assets are mandatorily measured at FVTPL.

1 The accounting policy in this section applies from 1 January 2018, the effective date of IFRS 9.

Critical accounting estimates and judgments

UBS AG exercises judgment in determining the appropriate level at which to assess its business models. In general, the assessment is performed at the product level, e.g., retail and commercial mortgages. In other cases, the assessment is carried out at a more granular level, e.g., loan portfolios by region, and, if required, further disaggregation is performed by business strategy. A detailed assessment is carried out considering how the financial assets are evaluated and reported to UBS AG's key management, the risks that affect the performance of the business and the way that management is compensated. In addition, UBS AG exercises judgment in determining the effect of sales of financial instruments on the business model assessment. In particular, an assessment is made on whether and the extent to which sales are consistent with the objective of the business model.

Contractual cash flow characteristics

In assessing whether the contractual cash flows are SPPI, UBS AG considers whether the contractual terms of the financial asset contain a term that could change the timing or amount of contractual cash flows arising over the life of the instrument, which could affect whether the instrument is considered to meet the SPPI criterion.

For example, UBS AG holds portfolios of private mortgage contracts and corporate loans in Personal & Corporate Banking that commonly contain clauses that provide for two-way compensation if prepayment occurs. The amount of compensation paid by or to UBS AG reflects the effect of changes in market interest rates. UBS AG has determined that the inclusion of the change in market interest rates in the compensation amount is reasonable for the early termination of the contract, and therefore results in contractual cash flows that are SPPI.

Critical accounting estimates and judgments

UBS AG applies judgment when considering whether certain contractual features, such as interest rate reset frequency or non-recourse features, significantly affect future cash flows and whether compensation paid or received on early termination of lending arrangements results in cash flows that are not SPPI. A thorough analysis of all relevant facts and circumstances is assessed before concluding whether contractual cash flows of the financial instrument are consistent with payments representing principal and interest.

After initial recognition, UBS AG classifies, measures and presents its financial assets and liabilities in accordance with IFRS 9, as described in the table on the following pages.

Note 1 Summary of significant accounting policies (continued)

Classification, measurement and presentation of financial assets from 1 January 2018

<table>
<tr><th colspan="2">Financial assets
Classification</th><th>Significant items included</th><th>Measurement and presentation</th></tr>
<tr><td colspan="2">Measured at amortized cost</td><td>This classification includes:
– cash and balances at central banks;
– loans and advances to banks;
– cash collateral receivables on securities borrowed;
– receivables on reverse repurchase agreements;
– cash collateral receivables on derivative instruments;
– residential and commercial mortgages;
– corporate loans;
– secured loans, including Lombard loans, and unsecured loans;
– loans to financial advisors; and
– debt securities held as high-quality liquid assets (HQLA).</td><td>Measured at amortized cost using the effective interest rate (EIR) method less allowances for expected credit losses (ECL) (refer to items 3c and 3g in this Note for more information).

The following items are recognized in the income statement:
– interest income, which is accounted for in accordance with item 3c in this Note;
– ECL and reversals; and
– foreign exchange translation gains and losses.

Upfront fees and direct costs relating to loan origination, refinancing or restructuring as well as to loan commitments – when it is probable that UBS AG will enter into a specific lending relationship – are deferred and amortized over the life of the loan using the EIR method.

When the financial asset at amortized cost is derecognized, the gain or loss is recognized in the income statement.

Amounts arising from exchange-traded derivatives (ETD) and certain over-the-counter (OTC) derivatives cleared through central clearing counterparties that are either considered to be daily settled or in substance net settled on a daily basis (refer to items 3d and 3i in this Note) are presented within Cash collateral receivables on derivative instruments.</td></tr>
<tr><td>Measured at FVOCI</td><td>Debt instruments measured at FVOCI</td><td>This classification primarily includes debt securities and certain asset-backed securities held as HQLA.</td><td>Measured at fair value with unrealized gains and losses reported in Other comprehensive income, net of applicable income taxes, until such investments are derecognized (when sold, collected or otherwise disposed). Upon derecognition, any accumulated balances in Other comprehensive income are reclassified to the income statement and reported within Other income.

The following items are recognized in the income statement:
– interest income, which is accounted for in accordance with item 3c in this Note;
– ECL and reversals; and
– foreign exchange translation gains and losses.

The amounts recognized in the income statement are determined on the same basis as for financial assets measured at amortized cost.</td></tr>
</table>

Note 1 Summary of significant accounting policies (continued)

Classification, measurement and presentation of financial assets from 1 January 2018 (continued)

<table>
<tr><th colspan="2">Financial assets Classification</th><th>Significant items included</th><th>Measurement and presentation</th></tr>
<tr><td rowspan="2">Measured at FVTPL</td><td>Held for trading</td><td>Financial assets held for trading include:
– all derivatives with a positive replacement value, except those that are designated and effective hedging instruments; and
– other financial assets acquired principally for the purpose of selling or repurchasing in the near term, or that are part of a portfolio of identified financial instruments that are managed together and for which there is evidence of a recent actual pattern of short-term profit taking. Included in this category are debt instruments (including those in the form of securities, money market paper, and traded corporate and bank loans) and equity instruments.</td><td rowspan="2">Measured at fair value with changes recognized in profit or loss.

Changes in fair value, initial transaction costs, dividends and gains and losses realized on disposal or redemption are recognized in Other net income from financial instruments measured at fair value through profit or loss, except interest income on instruments other than derivatives (refer to item 3c in this Note and Note 1b for more information), interest on derivatives designated as hedging instruments in certain types of hedge accounting relationships and forward points on certain short- and long-duration foreign exchange contracts, which are reported in Net interest income.

Derivative assets (including derivatives that are designated and effective hedging instruments) are generally presented as Derivative financial instruments, except those exchange-traded and OTC-cleared derivatives that are considered to be settled on a daily basis or in substance net settled on a daily basis, which are presented within Cash collateral receivables on derivative instruments.

The presentation of fair value changes on derivatives that are designated and effective hedging instruments depends on the type of hedge relationship (refer to item 3j in this Note for more information).

Financial assets held for trading (other than derivatives) are presented as Financial assets at fair value held for trading.

Other financial assets mandatorily measured at fair value through profit or loss are presented as Financial assets at fair value not held for trading, except for brokerage receivables, which are presented as a separate line item on UBS AG's balance sheet.</td></tr>
<tr><td>Mandatorily measured at FVTPL – Other</td><td>A financial asset is mandatorily measured at FVTPL if:
– it is not held in a business model whose objective is to hold assets to collect contractual cash flows or to hold them to collect contractual cash flows and sell; and/or
– the contractual terms give rise to cash flows that are not SPPI; and/or
– it is not held for trading.

The following financial assets are mandatorily measured at FVTPL:
– certain structured loans, certain commercial loans, receivables under reverse repurchase and cash collateral on securities borrowing agreements that are managed on a fair value basis;
– loans managed on a fair value basis and hedged with credit derivatives;
– certain debt securities held as HQLA and managed on a fair value basis;
– certain investment fund holdings and assets held to hedge delivery obligations related to cash-settled employee compensation plans – these assets represent holdings in investment funds, whereby the contractual cash flows do not meet the SPPI criterion because the entry and exit price is based on the fair value of the fund's assets;
– brokerage receivables, for which contractual cash flows do not meet the SPPI criterion because the aggregate balance is accounted for as a single unit of account, with interest being calculated on the individual components;
– auction rate securities, for which contractual cash flows do not meet the SPPI criterion because interest may be reset at rates that contain leverage;
– equity instruments; and
– assets held under unit-linked investment contracts.</td></tr>
</table>

Note 1 Summary of significant accounting policies (continued)

Classification, measurement and presentation of financial liabilities

<table>
<tr><th colspan="2">Financial liabilities
Classification</th><th>Significant items included</th><th>Measurement and presentation</th></tr>
<tr><td colspan="2">Measured at amortized cost</td><td>This classification includes:
– demand and time deposits;
– retail savings / deposits;
– amounts payable under repurchase agreements;
– cash collateral on securities lent;
– non-structured fixed-rate bonds;
– subordinated debt;
– certificates of deposit and covered bonds;
– obligations against funding from UBS Group AG and its subsidiaries ; and
– cash collateral payables on derivative instruments.</td><td>Measured at amortized cost using the EIR method.

Upfront fees and direct costs relating to the issuance or origination of the liability are deferred and amortized over the life of the liability using the EIR method.

When the financial liability at amortized cost is derecognized, the gain or loss is recognized in the income statement.

Amortized cost liabilities are presented on the balance sheet primarily as Amounts due to banks, Customer deposits, Payables from securities financing transactions, Debt issued measured at amortized cost and Funding from UBS Group AG and its subsidiaries.

Amounts arising from ETD and certain OTC derivatives cleared through central clearing counterparties that are either considered to be daily settled or in substance net settled on a daily basis (refer to items 3d and 3i in this Note for more information) are presented within Cash collateral payables on derivative instruments.</td></tr>
<tr><td rowspan="2">Measured at fair value through profit or loss</td><td>Held for trading</td><td>Financial liabilities held for trading include:
– all derivatives with a negative replacement value (including certain loan commitments), except those that are designated and effective hedging instruments; and
– obligations to deliver financial instruments, such as debt and equity instruments, that UBS AG has sold to third parties, but does not own (short positions).</td><td rowspan="2">Measurement of financial liabilities classified at FVTPL follows the same principles as for financial assets classified at FVTPL, except that the amount of change in the fair value of the financial liability that is attributable to changes in UBS AG's own credit risk is presented in OCI.

Financial liabilities measured at FVTPL are presented as Financial liabilities at fair value held for trading and Other financial liabilities designated at fair value, respectively, except for brokerage payables and debt issued, which are presented separately on UBS AG's balance sheet.

Derivative liabilities (including derivatives that are designated and effective hedging instruments) are generally presented as Derivative financial instruments, except those exchange-traded and OTC-cleared derivatives that are considered to be settled on a daily basis or in substance net settled on a daily basis, which are presented within Cash collateral payables on derivative instruments.

Bifurcated embedded derivatives are measured at fair value, but are presented on the same balance sheet line as the host contract measured at amortized cost.

Derivatives that are designated and effective hedging instruments are also measured at fair value. The presentation of fair value changes differs depending on the type of hedge relationship (refer to item 3j in this Note for more information).</td></tr>
<tr><td>Designated at FVTPL</td><td>UBS AG designates at FVTPL the following financial liabilities:
– issued hybrid debt instruments that primarily include equity-linked, credit-linked and rates-linked bonds or notes;
– issued debt instruments managed on a fair value basis;
– certain payables under repurchase agreements and cash collateral on securities lending agreements that are managed in conjunction with associated reverse repurchase agreements and cash collateral on securities borrowed (from 1 January 2018);
– amounts due under unit-linked investment contracts whose cash flows are linked to financial assets measured at FVTPL and eliminate an accounting mismatch (from 1 January 2018); and
– brokerage payables, which arise in conjunction with brokerage receivables and are measured at FVTPL to achieve measurement consistency (from 1 January 2018).</td></tr>
</table>

Comparative policy | *Policy applicable prior to 1 January 2018*
Prior to 1 January 2018, on initial recognition, UBS AG classified, measured and presented its financial assets and liabilities in accordance with IAS 39, *Financial Instruments: Recognition and Measurement*. Classification, measurement and presentation requirements in respect of financial liabilities have been substantially retained by IFRS 9 and are detailed in the "Classification, measurement and presentation of financial instruments from 1 January 2018" table. The following table sets out details of classification, measurement and presentation of financial assets prior to 1 January 2018.

Classification, measurement and presentation of financial assets prior to 1 January 2018

Financial assets Classification	Significant items included	Measurement and presentation[1]
Held for trading	Financial assets held for trading include: – all derivatives with a positive replacement value, except those that are designated and effective hedging instruments; and – any other financial asset acquired principally for the purpose of selling or repurchasing in the near term, or part of a portfolio of identified financial instruments that are managed together and for which there is evidence of a recent actual pattern of short-term profit taking. Included in this category are debt instruments (including those in the form of securities, money market paper and traded corporate and bank loans), equity instruments, and assets held under unit-linked investment contracts.	Measured at fair value with changes recognized in profit or loss. Changes in fair value, initial transaction costs and gains and losses realized on disposal or redemption are recognized in *Other net income from financial instruments measured at fair value through profit or loss* (prior to 1 January 2019: *Other net income from fair value changes on financial instruments*), except interest and dividend income on instruments other than derivatives (refer to item 3c in this Note), interest on derivatives designated as hedging instruments in certain types of hedge accounting relationships and forward points on certain short duration foreign exchange contracts, which are reported in *Net interest income.* Derivative assets are generally presented as *Derivative financial instruments.* Bifurcated embedded derivatives are measured at fair value, but presented on the same balance sheet line as the host contract measured at amortized cost. The presentation of fair value changes on derivatives that are designated and effective hedging instruments differs depending on the type of hedge relationship (refer to item 3j in this Note for more information). Financial assets held for trading (other than derivatives) are presented as *Financial assets at fair value held for trading.* Financial assets designated at fair value through profit or loss are presented as *Financial assets at fair value not held for trading.*
Designated at fair value through profit or loss	A financial asset may be designated at fair value through profit or loss only upon initial recognition and this designation is irrevocable. The fair value option can be applied only if one of the following criteria is met: – the financial instrument is a hybrid instrument that includes a substantive embedded derivative; – the financial instrument is part of a portfolio that is risk managed on a fair value basis and reported to senior management on that basis; or – the application of the fair value option eliminates or significantly reduces an accounting mismatch that would otherwise arise. UBS AG designated at fair value through profit or loss the following financial assets: – certain structured loans, reverse repurchase and securities borrowing agreements that are managed on a fair value basis; – loans that are hedged predominantly with credit derivatives – these instruments are designated at fair value to eliminate an accounting mismatch; – certain debt securities held as high-quality liquid assets (HQLA) and managed by Corporate Center – Group Treasury on a fair value basis; and – assets held to hedge delivery obligations related to cash-settled employee compensation plans – these assets are designated at fair value in order to eliminate an accounting mismatch that would otherwise arise as a result of the liability being measured on a fair value basis.	

1 Presentation categories in this table reflect retrospective amendments to UBS AG's balance sheet presentation carried out upon transition to IFRS 9 to facilitate comparability.

Note 1 Summary of significant accounting policies (continued)

Classification, measurement and presentation of financial assets prior to 1 January 2018 (continued)

Financial assets Classification	Significant items included	Measurement and presentation
Loans and receivables (amortized cost)	Non-derivative financial assets with fixed or determinable payments that are not quoted in an active market and are not assets for which UBS AG may not recover substantially all of its initial net investment for reasons other than credit deterioration. This classification includes: – cash and balances with central banks; – cash collateral receivables on derivative instruments; – residential and commercial mortgages; – secured loans, including reverse repurchase agreements, receivables under stock borrowing and Lombard loans, and unsecured loans; – certain securities held within Corporate Center – Non-core and Legacy Portfolio; and – trade and lease receivables.	Measured at amortized cost using the effective interest rate method less allowances for credit losses (refer to items 3c and 3g in this Note). Upfront fees and direct costs relating to loan origination, refinancing or restructuring as well as to loan commitments are deferred and amortized over the life of the loan using the effective interest rate method. Loans and receivables are presented on the balance sheet primarily as *Cash and balances with central banks, Loans and advances to banks, Loans and advances to customers, Receivables from securities financing transactions* and *Cash collateral receivables on derivative instruments.* Amounts arising from exchange-traded derivatives (ETD) and certain over-the-counter (OTC) derivatives cleared through central clearing counterparties that are either considered to be daily settled or qualify for offsetting (refer to items 3d and 3i in this Note) are presented within *Cash collateral receivables on derivative instruments.*
Available for sale	Financial assets classified as available for sale are non-derivative financial assets that are not classified as held for trading, designated at fair value through profit or loss, or loans and receivables. This classification mainly includes debt securities held as HQLA and managed by Corporate Center – Group Treasury, certain asset-backed securities managed by Corporate Center – Group Treasury, investment fund holdings and strategic and commercial equity investments.	Measured at fair value with unrealized gains and losses reported in *Other comprehensive income,* net of applicable income taxes, until such investments are sold, collected or otherwise disposed of, or until any such investment is determined to be impaired (refer to item 3g in this Note). Upon disposal, any accumulated balances in *Other comprehensive income* are reclassified to the income statement and reported within *Other income.* Interest and dividend income are recognized in the income statement in accordance with item 3c in this Note. Refer to item 13 in this Note for information about the treatment of foreign exchange translation gains and losses.
Held to maturity	Non-derivative financial assets with fixed or determinable payments and fixed maturities for which UBS AG has the positive intention and ability to hold to maturity. This classification mainly includes debt securities held as HQLA and managed by Corporate Center – Group Treasury.	Measured at amortized cost using the effective interest rate method less allowances for credit losses (refer to items 3c and 3g in this Note).

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c. Interest income and expense

Interest income and expense are recognized in the income statement applying the effective interest rate (EIR) method. When calculating the EIR for financial instruments (other than credit-impaired financial instruments), UBS AG estimates future cash flows considering all contractual terms of the instrument, but not expected credit losses.

In determining interest income and expense, the EIR is applied to the gross carrying amount of the financial asset (unless the asset is credit-impaired) or the amortized cost of a financial liability (prior to 1 January 2018: the amortized cost of a financial asset or financial liability). However, when a financial asset becomes credit-impaired after initial recognition, interest income is determined by applying the EIR to the amortized cost of the instrument, which represents the gross carrying amount adjusted for any credit loss allowance. Furthermore, for financial assets that were credit-impaired on initial recognition, interest is determined by applying a credit-adjusted EIR to the amortized cost of the instrument.

Upfront fees, including loan commitment fees where a loan is expected to be issued, and direct costs are included within the initial measurement of a financial instrument measured at amortized cost or FVOCI (prior to 1 January 2018: the financial asset classified as available for sale). Such fees and costs are therefore recognized over the expected life of the instrument as part of its EIR.

Fees related to loan commitments where no loan is expected to be issued, as well as loan syndication fees where UBS AG does not retain a portion of the syndicated loan or where UBS AG does retain a portion of the syndicated loan at the same effective yield for comparable risk as other participants, are included in *Net fee and commission income*.

→ **Refer to item 4 in this Note for more information**

Presentation of interest in the income statement

Effective from 1 January 2018, interest income or expense on financial instruments measured at amortized cost and financial assets measured at FVOCI (prior to 1 January 2018: financial assets classified as available for sale) are presented separately within *Interest income from financial instruments measured at amortized cost and fair value through other comprehensive income* and *Interest expense from financial instruments measured at amortized cost*.

UBS AG also presents interest income and expense on financial instruments (excluding derivatives) measured at FVTPL including forward points on certain short- and long-duration foreign exchange contracts separately in *Interest income* (or *Interest expense*) *from financial instruments measured at fair value through profit or loss*. Furthermore, interest income and expense on derivatives designated as hedging instruments in effective hedge relationships are presented consistently with the interest income and expense of the respective hedged item.

Interest income on financial assets, excluding derivatives, is included in interest income when positive and in *Interest expense* when negative, because negative interest income arising on a financial asset does not meet the definition of revenue. Similarly, interest expense on financial liabilities, excluding derivatives, is included in interest expense, except when interest rates are negative, in which case it is included in interest income.

→ **Refer to item 3j in this Note and Note 3 for more information**

d. Derecognition

Financial assets

UBS AG derecognizes a financial asset, or a portion of a financial asset, from its balance sheet when the contractual rights to cash flows from the asset have expired, or have been transferred, usually by sale, thus exposing the purchaser to either substantially all the risks and rewards of the asset or a significant part of the risks and rewards combined with a practical ability to sell or pledge the asset.

A financial asset is considered to have been transferred when UBS AG: (i) transfers the contractual rights to receive the cash flows of the financial asset; or (ii) retains the contractual rights to receive the cash flows of that asset, but assumes a contractual obligation to pay the cash flows to one or more entities.

Where financial assets have been pledged as collateral or in similar arrangements, they are considered to have been transferred if the counterparty has received the contractual right to the cash flows of the pledged assets, as may be evidenced, for example, by the counterparty's right to sell or repledge the assets. Where the counterparty to the pledged financial assets has not received the contractual right to the cash flows, UBS AG does not consider this to be a transfer for the purposes of derecognition.

Note 1 Summary of significant accounting policies (continued)

In transactions where substantially all of the risks and rewards of ownership of a financial asset are neither retained nor transferred, UBS AG derecognizes the financial asset if control over the asset is surrendered, and the rights and obligations retained following the transfer are recognized separately as assets and liabilities, respectively. In transfers where control over the financial asset is retained, UBS AG continues to recognize the asset to the extent of its continuing involvement, determined by the extent to which it is exposed to changes in the value of the transferred asset following the transfer.

Certain over-the-counter (OTC) derivative contracts and most exchange-traded futures and option contracts cleared through central clearing counterparties and exchanges are considered to be settled on a daily basis through the daily margining process, as the payment or receipt of the variation margin represents legal or economic settlement of a derivative contract, which results in derecognition of the associated positive and negative replacement values.

→ **Refer to item 3h of this Note and Note 25 for more information**

Financial liabilities

UBS AG derecognizes a financial liability from its balance sheet when it is extinguished; i.e., when the obligation specified in the contract is discharged, canceled or expires. When an existing financial liability is exchanged for a new one from the same lender on substantially different terms, or the terms of an existing liability are substantially modified, such an exchange or modification results in derecognition of the original liability and the recognition of a new liability with any difference in the respective carrying amounts being recognized in the income statement.

e. Securities borrowing / lending and repurchase / reverse repurchase transactions

Securities borrowing / lending and repurchase / reverse repurchase transactions are generally entered into on a collateralized basis. In such transactions, UBS AG typically borrows or lends equity and debt securities in exchange for securities or cash collateral.

These transactions are treated as collateralized financing transactions where the securities transferred / received are not derecognized or recognized on the balance sheet. Securities transferred / received with the right to resell or repledge are disclosed separately.

In reverse repurchase and securities borrowing agreements, the cash delivered is derecognized and a corresponding receivable, including accrued interest, is recorded in the balance sheet line *Receivables from securities financing transactions,* representing UBS AG's right to receive the cash. Similarly, in repurchase and securities lending agreements, the cash received is recognized and a corresponding obligation, including accrued interest, is recorded in *Payables from securities financing transactions*. Additionally, the sale of securities that is settled by delivering securities received in reverse repurchase or securities borrowing transactions triggers the recognition of a trading liability.

Repurchase and reverse repurchase transactions with the same counterparty, maturity, currency and central securities depository are generally presented net, subject to meeting the offsetting requirements described in item 3i of this Note.

→ **Refer to Notes 26 and 25 for more information**

f. Fair value of financial instruments

UBS AG accounts for a significant portion of its assets and liabilities at fair value. Fair value is the price on the measurement date that would be received for the sale of an asset or paid to transfer a liability in an orderly transaction between market participants in the principal market, or in the most advantageous market in the absence of a principal market.

All financial instruments measured at fair value are categorized into one of three fair value hierarchy levels. Level 1 financial instruments are those for which fair values can be derived from quoted prices in active markets. Level 2 financial instruments are those for which fair values must be derived using valuation techniques for which all significant inputs are, or are based on, observable market data. Level 3 financial instruments are those for which fair values can only be derived on the basis of valuation techniques for which significant inputs are not based on observable market data.

Critical accounting estimates and judgments

The use of valuation techniques, modeling assumptions and estimates of unobservable market inputs in the fair valuation of financial instruments requires significant judgment and could affect the amount of gain or loss recorded for a particular position. Valuation techniques that rely more heavily on unobservable inputs inherently require a higher level of judgment than those entirely based on observable inputs.

Valuation techniques, including models, that are used to determine fair values are periodically reviewed and validated by qualified personnel, independent of those who created them. Models are calibrated with the objective of ensuring that outputs reflect observable market data, to the extent possible. Also, UBS AG prioritizes the use of observable inputs, when available, over unobservable inputs. Judgment is required in selecting appropriate models as well as inputs for which observable data is less readily available.

UBS AG's governance framework over fair value measurement is described in Note 24b.

The level of subjectivity and the degree of management judgment involved in the development of estimates and the selection of assumptions are more significant for instruments valued using specialized and sophisticated models and where some or all of the parameter inputs are less observable (Level 3 instruments) and may require adjustment to reflect factors that market participants would consider in estimating fair value, such as close-out costs, credit exposure, model-driven valuation uncertainty, funding costs and benefits, trading restrictions and other factors, which are presented in Note 24d. UBS AG provides a sensitivity analysis of the estimated effects arising from changing significant unobservable inputs in Level 3 financial instruments to reasonably possible alternative assumptions within Note 24g.

→ **Refer to Note 24 for more information**

g. Allowances and provisions for expected credit losses

Policy applicable from 1 January 2018[1]

Expected credit losses (ECL) are recognized for financial assets measured at amortized cost, financial assets measured at FVOCI, fee and lease receivables, financial guarantees and loan commitments. ECL are also recognized on the undrawn portion of revolving revocable credit lines, which include UBS AG's credit card limits and master credit facilities, which are customary in the Swiss market for corporate and commercial clients. UBS AG refers to both as "other credit lines," with clients allowed to draw down on-demand balances (with the Swiss master credit facilities also allowing for term products) and which can be terminated by UBS AG at any time. Though these other credit lines are revocable, UBS AG is exposed to credit risk because the client has the ability to draw down funds before UBS AG can take credit risk mitigation actions.

Recognition of expected credit losses

ECL represent the difference between contractual cash flows and those UBS AG expects to receive, discounted at the EIR. For loan commitments and other credit facilities in scope of ECL, expected cash shortfalls are determined by considering expected future drawdowns.

ECL are recognized on the following basis:

- Maximum 12-month ECL are recognized from initial recognition, reflecting the portion of lifetime cash shortfalls that would result if a default occurs in the 12 months after the reporting date, weighted by the risk of a default occurring. Instruments in this category are referred to as instruments in stage 1. For instruments with a remaining maturity of less than 12 months, ECL are determined for this shorter period.
- Lifetime ECL are recognized if a significant increase in credit risk (SICR) is observed subsequent to the instrument's initial recognition, reflecting lifetime cash shortfalls that would result from all possible default events over the expected life of a financial instrument, weighted by the risk of a default occurring. Instruments in this category are referred to as instruments in stage 2. Where an SICR is no longer observed, the instrument will move back to stage 1.
- Lifetime ECL are always recognized for credit-impaired financial instruments, referred to as instruments in stage 3. The IFRS 9 determination of whether an instrument is credit-impaired is based on the occurrence of one or more loss events, with lifetime ECL generally derived by estimating expected cash flows based on a chosen recovery strategy. Credit-impaired exposures may include positions for which no loss has occurred or no allowance has been recognized, for example, because they are expected to be fully recoverable through the collateral held.
- Changes in lifetime ECL since initial recognition are also recognized for assets that are purchased or originated credit-impaired (POCI). POCI financial assets are initially recognized at fair value, with interest income subsequently being recognized based on a credit-adjusted EIR. POCI financial instruments include those that are newly recognized following a substantial restructuring and remain a separate category until derecognition.

UBS AG does not apply the low-credit-risk practical expedient that allows a lifetime ECL for lease or fee receivables to be recognized irrespective of whether a significant increase in credit risk has occurred. Instead, UBS AG has incorporated lease and fee receivables into the standard ECL calculation.

1 The accounting policy in this section applies from 1 January 2018, the effective date of IFRS 9.

Note 1 Summary of significant accounting policies (continued)

A write-off is made when all or part of a financial asset is deemed uncollectible or forgiven. Write-offs reduce the principal amount of a claim and are charged against previously established allowances for credit losses. Recoveries, in part or in full, of amounts previously written off are generally credited to *Credit loss (expense) / recovery*. Write-offs and partial write-offs represent derecognition / partial derecognition events.

ECL are recognized in profit or loss with a corresponding ECL allowance reported as a decrease in the carrying amount of financial assets measured at amortized cost on the balance sheet. For financial assets measured at fair value through OCI, the carrying amount is not reduced, but an accumulated amount is recognized in OCI. For off-balance sheet financial instruments and other credit lines, provisions for ECL are reported in *Provisions*. ECL are recognized within the income statement in *Credit loss (expense) / recovery.*

Default and credit impairment

UBS AG applies a single definition of default for classifying assets and determining the probability of default of its obligors for risk modeling purposes. The definition of default is based on quantitative and qualitative criteria. A counterparty is classified as defaulted at the latest when material payments of interest, principal or fees are overdue for more than 90 days, or more than 180 days for certain exposures in relation to loans to private and commercial clients in Personal & Corporate Banking, and to private clients of Global Wealth Management Region Switzerland. UBS AG does not consider the general 90-day presumption for default recognition appropriate for these latter portfolios based on an analysis of the cure rates, which demonstrated that strict application of the 90-day criterion would not accurately reflect the inherent credit risk. Counterparties are also classified as defaulted when bankruptcy, insolvency proceedings or enforced liquidation have commenced; obligations have been restructured on preferential terms (forbearance); or there is other evidence that payment obligations will not be fully met without recourse to collateral. The latter may be the case even if, to date, all contractual payments have been made when due. If a counterparty is defaulted, generally all claims against the counterparty are treated as defaulted.

An instrument is classified as credit-impaired if the counterparty is defaulted, and/or the instrument is identified as POCI. An instrument is POCI if it has been purchased at a deep discount to its carrying amount following a risk event of the issuer or originated with a defaulted counterparty. Once a financial asset is classified as defaulted / credit-impaired (except when it is POCI), it is reported as a stage 3 instrument and remains as such unless all past due amounts have been rectified, additional payments have been made on time, the position is not classified as credit-restructured, and there is general evidence of credit recovery. A three-month probation period is applied before a transfer back to stages 1 or 2 can be triggered. However, most instruments remain in stage 3 for a longer period.

Measurement of expected credit losses

IFRS 9 ECL reflect an unbiased, probability-weighted estimate based on either loss expectations resulting from default events over a maximum 12-month period from the reporting date or over the remaining life of a financial instrument. The method used to calculate individual probability-weighted unbiased ECL is based on a combination of the following principal factors: probability of default (PD), loss given default (LGD) and exposure at default (EAD). Parameters are generally determined on an individual financial asset level. Based on the materiality of the portfolio, for credit card exposures and personal account overdrafts in Switzerland, and certain loans to financial advisors of Global Wealth Management Region Americas, a portfolio approach is applied that derives an average PD and LGD for the entire portfolio. PDs and LGDs used in the ECL calculation are point in time (PIT)-based for key portfolios and consider both current conditions and expected cyclical changes. For each instrument or group of instruments, parameter time series are generated consisting of the instruments' PD, LGD and EAD profiles considering the respective period of exposure to credit risk. For material portfolios, PD and LGD are determined for four different scenarios, whereas EAD projections are treated as scenario independent.

For the purpose of determining the ECL-relevant parameters, UBS AG leverages its Pillar 1 internal ratings-based (IRB) models that are also used in determining expected loss (EL) and risk-weighted assets under the Basel III framework and Pillar 2 stress loss models. Adjustments have been made to these models and new IFRS 9-related models have been developed that consider the complexity, structure and risk profile of relevant portfolios and take account of the fact that PDs and LGDs used in the ECL calculation are PIT-based, as opposed to the corresponding Basel III through-the-cycle (TTC) parameters. All models that are relevant for measuring expected credit losses have been subject to the existing model validation and oversight processes. The assignment of internal counterparty rating grades and the determination of default probabilities for the purposes of Basel III are not affected by the IFRS 9 ECL calculation.

Probability of default (PD): The PD represents the likelihood of a default over a specified time period. A 12-month PD represents the likelihood of default determined for the next 12 months and a lifetime PD represents the probability of default over the remaining lifetime of the instrument. The lifetime PD calculation is based on a series of 12-month PIT PDs that are derived from TTC PDs and scenario forecasts. This modeling is region-, industry- and client segment-specific and considers both macroeconomic scenario-dependencies and client-idiosyncratic information. To derive the cumulative lifetime PD per scenario, the series of 12-month PIT PDs are transformed into marginal PIT PDs, taking any assumed default events from prior periods into account.

Loss given default (LGD): The LGD represents an estimate of the loss at the time of a potential default occurring during the life of a financial instrument. The determination of the LGD takes into account expected future cash flows from collateral and other credit enhancements, or expected payouts from bankruptcy proceedings for unsecured claims and, where applicable, time to realization of collateral and the seniority of claims. The LGD is commonly expressed as a percentage of the EAD.

Exposure at default (EAD): The EAD represents an estimate of the exposure to credit risk at the time of a potential default occurring during the life of a financial instrument. It represents the cash flows outstanding at the time of default, considering expected repayments, interest payments and accruals, discounted at the EIR. Future drawdowns on facilities are considered through a credit conversion factor (CCF) that is reflective of historical drawdown and default patterns and the characteristics of the respective portfolios. ECL-specific CCFs have been modeled to capture client segment- and product-specific patterns after removing Basel III standard-specific elements, i.e., conservatism and focus on a 12-month period prior to default.

Estimation of expected credit losses

Number of scenarios and estimation of scenario weights

The determination of the probability-weighted ECL requires evaluating a range of diverse and relevant future economic conditions, especially with a view to modeling the non-linear effect of assumptions about macroeconomic factors on the estimate.

To accommodate this requirement, UBS AG uses four different economic scenarios in the ECL calculation: an upside, a baseline, a mild downside and a severe downside scenario. Each scenario is represented by a specific scenario narrative, which is relevant considering the exposure of key portfolios to economic risks, and for which a set of consistent macroeconomic variables is determined. Those variables range from above-trend economic growth to severe recession. The baseline scenario is aligned to the economic and market assumptions used for UBS AG business planning purposes. An econometric model is used to provide an input into the scenario weight assessment process giving a first indication of the probability that the GDP forecast used for each scenario would materialize, if historically observed deviations of GDP growth from trend growth were representative. As such historical analyses of GDP development do not include an assessment of the underlying economic or political causes, management positions the model output into the context of current conditions and future expectations and applies material judgment in determining the final scenario weights. The determined weights constitute the probabilities that the respective set of macroeconomic conditions will occur and not that the chosen particular narratives with the related macroeconomic variables will materialize.

Macroeconomic and other factors

The range of macroeconomic, market and other factors that is modeled as part of the scenario determination is wide, and historical information is used to support the identification of the key factors. As the forecast horizon increases, the availability of information decreases and judgment increases. For cycle-sensitive PD and LGD determination purposes, UBS AG projects the relevant economic factors for a period of three years before reverting, over a specified period, to a cycle-neutral PD and LGD for longer-term projections.

Factors relevant for the ECL calculation vary by type of exposure and are determined during the credit cycle index model development process in close alignment with expert judgment. Certain variables may only be relevant for specific types of exposures, such as house price indices for mortgage loans, while other variables have key relevance in the ECL calculation for all exposures. Regional and client segment characteristics are generally taken into account, with specific focus on Switzerland and the US considering UBS AG's key ECL-relevant portfolios.

For UBS AG, the following forward-looking macroeconomic variables represent the most relevant factors in the ECL calculation:

- GDP growth rates, given their significant effect on borrowers' performance;
- house price indices, given their significant effect on mortgage collateral valuations;
- unemployment rates, given their significant effect on private clients' ability to meet contractual obligations;
- interest rates, given their significant effect on the counterparties' abilities to service debt;
- consumer price indices, given their overall relevance for companies' performance, private clients' purchasing power and economic stability; and
- equity indices, given that they are an important factor in our corporate rating tools.

The forward-looking macroeconomic assumptions used in the ECL calculation are developed by UBS AG economists, risk methodology personnel and credit risk officers. Assumptions and scenarios are validated and approved through a Scenario Committee and an Operating Committee, which also aim to ensure a consistent use of forward-looking information throughout UBS AG, including in the business planning process. ECL inputs are tested and reassessed for appropriateness at least once a quarter and appropriate adjustments are made when needed.

Scenario generation, review process and governance

All aspects of the scenario selection, including the specific narratives, their weight for the ECL estimation, and the key macroeconomic and other factors, are subject to a formal governance and approval process.

Note 1 Summary of significant accounting policies (continued)

A team of economists, who are part of Group Risk Control, provide the basic analysis taking into account information obtained through established risk identification and assessment processes, which involve a broad range of experts, in particular, risk specialists and other in-house economists. Material risks with a high likelihood of materializing are then factored into the scenario selection process. Once narratives have been developed, key macroeconomic factors that are consistent with the severity of the case and interdependencies are determined.

The scenarios, their weight and the key macroeconomic and other factors are subject to a critical assessment by members of the Scenario Committee, where senior credit officers from the divisions and representatives from Group Risk Control are represented. Important aspects for the review are the extent to which the selected scenarios reflect the vulnerabilities of the relevant portfolios; whether their transformation into PIT PD and LGD values is in line with credit risk officers' expectations; and whether there may be pockets of exposures, where particular credit risk concerns may not be capable of being addressed systematically and require an expert-based overlay for stage allocation and ECL allowance. This also ensures a consistent use of forward-looking information throughout UBS AG and an alignment with the business planning process.

The Operating Committee is jointly chaired by the Group Controller and Chief Accounting Officer, and the Risk Chief Operating Officer and Group Chief Risk Model Officer, and is comprised of the divisional Chief Risk Officers and divisional Chief Financial Officers as well as senior Corporate Center Risk and Finance representatives. They review the proposals submitted by the Scenario Committee and approve the final selection of scenarios and factors and any expert-based overlays as they may be required to cover temporary issues, either related to specific risk elements in a portfolio, or due to identified technical deficiencies pending remediation (model updates, data quality, etc.).

The Group Model Governance Board, as the highest authority under UBS AG's model governance framework, ratifies the decisions by the Operating Committee.

ECL measurement period

The period for which lifetime ECL are determined is based on the maximum contractual period that UBS AG is exposed to credit risk, taking into account contractual extension, termination and prepayment options. For irrevocable loan commitments and financial guarantee contracts, the measurement period represents the maximum contractual period for which UBS AG has an obligation to extend credit.

Additionally, some financial instruments include both an on-demand loan and a revocable undrawn commitment, where the contractual cancelation right does not limit UBS AG's exposure to credit risk to the contractual notice period, as the client has the ability to draw down funds before UBS AG can take risk-mitigating actions. In such cases, UBS AG is required to estimate the period over which it is exposed to credit risk. This applies to UBS AG's credit card limits, which do not have a defined contractual maturity date, are callable on demand and where the drawn and undrawn components are managed as one unit. The exposure arising from UBS AG's credit card limits is not significant and is managed at a portfolio level, with credit actions triggered when balances are past due. An ECL measurement period of seven years is applied for credit card limits, capped at 12 months for stage 1 balances, as a proxy for the period that UBS AG is exposed to credit risk.

Customary master credit agreements in the Swiss corporate market also include on-demand loans and revocable undrawn commitments. For smaller commercial facilities, a risk-based monitoring (RbM) approach is in place that highlights negative trends as risk events, at an individual facility level, based on a combination of continuously updated risk indicators. The risk events trigger additional credit reviews by a risk officer, allowing for informed credit decisions to be taken. Larger corporate facilities are not subject to RbM, but are reviewed at least annually through a formal credit review. UBS AG has assessed these credit risk management practices and considers both the RbM approach and formal credit review as substantive credit reviews resulting in a re-origination of the facility. Following this, a 12-month measurement period from the reporting date is used for both types of facilities as an appropriate proxy of the period over which UBS AG is exposed to credit risk, with 12 months also used as a look-back period for assessing SICR, always from the respective reporting date.

Significant increase in credit risk

Financial instruments subject to ECL are monitored on an ongoing basis. To determine whether the recognition of a maximum 12-month ECL continues to be appropriate, an assessment is made as to whether an SICR has occurred since initial recognition of the financial instrument. The assessment criteria include both quantitative and qualitative factors. UBS AG does not make use of the expedient that no particular SICR test is required for instruments that have low credit risk at reporting date.

Primarily, UBS AG assesses changes in an instrument's risk of default on a quantitative basis by comparing the annualized forward-looking and scenario-weighted lifetime PD of an instrument determined at two different dates:
– at the reporting date; and
– at inception of the instrument.

In both cases, the respective PDs are determined for the residual lifetime of the instrument, i.e., the period between the reporting date and maturity. If, based on UBS AG's quantitative modeling, an increase exceeds a set threshold, an SICR is deemed to have occurred and the instrument is transferred to stage 2 with lifetime ECL being recognized.

The threshold applied varies depending on the original credit quality of the borrower. For instruments with lower default probabilities at inception due to good credit quality of the counterparty, the SICR threshold is set at a higher level than for instruments with higher default probabilities at inception. This implies that for instruments with initially lower default probabilities, a relatively higher deterioration in credit quality is needed to trigger an SICR than for those instruments with originally higher PDs. The SICR assessment based on PD changes is made at an individual financial asset level. A high-level overview of the SICR trigger, which is a multiple of the annualized remaining lifetime PIT PD expressed in rating downgrades that entail the same multiple of PD values, together with the corresponding ratings at origination of an instrument, is provided in the "SICR thresholds" table below. This simplified view is aligned to internal ratings as disclosed in "Internal UBS AG rating scale and mapping of external ratings" presented in "Credit risk" in the "Risk management and control" section of this report. The actual SICR thresholds applied are defined on a more granular level interpolating between the values shown in the table below.

SICR thresholds

Internal rating at origination of the instrument	Rating downgrades / SICR trigger
0–3	3
4–8	2
9–13	1

→ **Refer to the "Risk management and control" section of this report for more details about the bank's internal grading system**

Irrespective of the SICR assessment based on default probabilities, credit risk is generally deemed to have significantly increased for an instrument if the contractual payments are more than 30 days past due. For certain less material portfolios, specifically the Swiss credit card portfolio and the loans to financial advisors of Global Wealth Management Region Americas, the 30-day past due criterion is used as the primary indicator of an SICR. Where instruments are transferred to stage 2 due to the 30-day past due criterion, a minimum period of six months is applied before a transfer back to stage 1 can be triggered. For instruments in Personal & Corporate Banking and Global Wealth Management Region Switzerland that are between 90 and 180 days past due but have not been reclassified to stage 3, a one-year period is applied before a transfer back to stage 1 can be triggered.

Additionally, based on individual counterparty-specific indicators, external market indicators of credit risk or general economic conditions, counterparties may be moved to a watch list, which is used as a secondary qualitative indicator for an SICR and hence for a transfer to stage 2. Exception management is further applied, allowing for individual and collective adjustments on exposures sharing the same credit risk characteristics to take account of specific situations that are not otherwise fully reflected. Instruments for which an SICR since initial recognition is determined based on criteria other than changed default probabilities or watch list items remain in stage 2 for at least six months post resolution of the stage 2 trigger event.

In general, the overall SICR determination process does not apply to Lombard loans, securities financing transactions and certain other asset-based lending transactions, because of the risk management practices adopted, including daily monitoring processes with strict margining requirements that often require the delivery of collateral within a number of days. If margin calls are not satisfied, a position is closed out and classified as a stage 3 position. In exceptional cases, an individual adjustment and a transfer into stage 2 may be made to take account of specific facts.

Credit risk officers are responsible for ensuring that the stage allocation of instruments reflects the identification of an SICR, which for accounting purposes is in some aspects different from internal credit risk management processes for loans with increased credit risk, mainly because ECL accounting requirements are instrument-specific, such that a borrower can have multiple exposures allocated to different stages, and that maturing loans in stage 2 will migrate to stage 1 upon renewal irrespective of the actual credit risk at that time. Under a risk-based approach, a holistic counterparty credit assessment and the absolute level of risk at any given date will determine what risk mitigating actions may be warranted.

→ **Refer to the "Risk management and control" section of this report for more information**

Note 1 Summary of significant accounting policies (continued)

Critical accounting estimates and judgments

The calculation of ECL requires management to apply significant judgment and make estimates and assumptions that involve significant uncertainty at the time they are made. Changes to these estimates and assumptions can result in significant changes to the timing and amount of ECL to be recognized.

Determination of a significant increase in credit risk
IFRS 9 does not include a definition of what constitutes an SICR. UBS AG's assessment of whether an SICR has occurred since initial recognition is based on reasonable and supportable forward-looking information, both qualitative and quantitative, and includes significant management judgment. More stringent criteria could significantly increase the number of instruments migrating to stage 2. An IFRS 9 Operating Committee has been established to review and challenge the SICR approach and any potential changes and determinations made in the quarter.

Scenarios, scenario weights and macroeconomic factors
ECL reflect an unbiased and probability-weighted amount, which UBS AG determines by evaluating a range of possible outcomes. Management selects forward-looking scenarios and judges the suitability of respective weights to be applied. Each of the scenarios is based on management's assumptions around future economic conditions in the form of macroeconomic, market and other factors. Changes in the scenarios and weights, the corresponding set of macroeconomic variables and the assumptions made around those variables for the forecast horizon would have a significant effect on the ECL. An IFRS 9 Scenario Committee, in addition to the Operating Committee, has been established to derive, review and challenge the selection and weights.

ECL measurement period
Lifetime ECL are generally determined based upon the contractual maturity of the transaction, which significantly affects ECL. The ECL calculation is therefore sensitive to any extension of contractual maturities triggered by business decisions, consumer behaviors and an increased number of stage 2 positions. In addition, for credit card limits and Swiss callable master credit facilities, judgment is required as UBS AG must determine the period over which it is exposed to credit risk. A seven-year period has been applied for credit card limits, capped at 12 months for stage 1 positions, and a 12-month period has been applied for master credit facilities.

Modeling and management adjustments
A number of complex models have been developed or modified to calculate ECL, with additional management adjustments required. Internal counterparty rating changes, new or revised models and changes to data may significantly affect ECL. The models are governed by UBS AG's model validation controls, which aim to ensure independent verification, and are approved by the Group Model Governance Board (the GMGB). The management adjustments are approved by the IFRS 9 Operating Committee and endorsed by the GMGB.

UBS AG provides a sensitivity analysis of the effect of scenario selection, scenario weights and SICR trigger points on ECL measurement within Note 23g.

Comparative policy | *Policy applicable prior to 1 January 2018*
A claim is impaired and an allowance or provision for credit losses is recognized when objective evidence demonstrates that a loss event has occurred after the initial recognition and that the loss event has an effect on the future cash flows that can be reliably estimated (incurred loss approach). UBS AG considers a claim to be impaired if it will be unable to collect all amounts due thereon based on the original contractual terms as a result of credit deterioration of the issuer or counterparty. A claim can be a loan or receivable measured at amortized cost, or a commitment, such as a letter of credit, a guarantee or a similar instrument.

An allowance for credit losses is reported as a decrease in the carrying amount of a financial asset. For an off-balance sheet item, such as a commitment, a provision for credit losses is reported in *Provisions*. Changes to allowances and provisions for credit losses are recognized in *Credit loss (expense) / recovery*.

Critical accounting estimates and judgments

Allowances and provisions for credit losses are evaluated at both a counterparty-specific level and collectively. Judgment is used in making assumptions about the timing and amount of impairment losses.

Counterparty-specific allowances and provisions
Loans are evaluated individually for impairment if objective evidence indicates that a loan may be impaired. Individual credit exposures are evaluated on the basis of the borrower's overall financial condition, resources and payment record, the prospects of support from contractual guarantors and, where applicable, the realizable value of any collateral. The impairment loss for a loan is the excess of the carrying amount of the financial asset over the estimated recoverable amount. The estimated recoverable amount is the present value, calculated using the loan's original effective interest rate, of expected future cash flows, including amounts that may result from restructuring or the liquidation of collateral. If a loan has a variable interest rate, the discount rate for calculating the recoverable amount is the current effective interest rate. Upon impairment, interest income is accrued by applying the original effective interest rate to the impaired carrying amount of the loan.

All impaired loans are reviewed and analyzed at least annually. Any subsequent changes to the amounts and timing of the expected future cash flows compared with prior estimates result in a change in the allowance for credit losses and are charged or credited to *Credit loss (expense) / recovery*. An allowance for impairment is reversed only when the credit quality has improved to such an extent that there is reasonable assurance of timely collection of principal and interest in accordance with the original contractual terms of the instrument, or the equivalent value thereof. A write-off is made when all or part of a financial asset is deemed uncollectible or forgiven. Write-offs reduce the principal amount of a claim and are charged against previously established allowances for credit losses. Recoveries, in part or in full, of amounts previously written off are credited to *Credit loss (expense) / recovery.*

Collective allowances and provisions

Collective allowances and provisions are calculated for portfolios with similar credit risk characteristics, taking into account historical loss experience and current conditions. The methodology and assumptions used are reviewed regularly to reduce any differences between estimated and actual loss experience. For all of its portfolios, UBS AG also assesses whether there have been any unforeseen developments that might result in impairments that are not immediately observable at a counterparty level. To determine whether an event-driven collective allowance for credit losses is required, UBS AG considers global economic drivers to assess the most vulnerable countries and industries. As the allowance cannot be allocated to individual loans, the loans are not considered to be impaired and interest is accrued on each loan according to its contractual terms. If objective evidence becomes available that indicates that an individual financial asset is impaired, it is removed from the group of financial assets assessed for impairment on a collective basis and is assessed separately as counterparty-specific.

Impairment of financial assets classified as available for sale

At each balance sheet date, UBS AG assesses whether indicators of impairment are present. Available-for-sale debt instruments are impaired when there is objective evidence, using the same criteria described on the previous page, that, as a result of one or more events that occurred after the initial recognition of the asset, the estimated future cash flows have decreased.

Objective evidence that there has been an impairment of an available-for-sale equity instrument is a significant or prolonged decline in the fair value of the asset. UBS AG uses a rebuttable presumption that such instruments are impaired where there has been a decline in fair value of more than 20% below its original cost or fair value has been below original cost for more than six months.

To the extent a financial asset classified as available for sale is determined to be impaired, the related cumulative net unrealized loss previously recognized in *Other comprehensive income* is reclassified to the income statement within *Other income*. For equity instruments, any further loss is recognized directly in the income statement, whereas for debt instruments, any further loss is recognized in the income statement only if there is additional objective evidence of impairment. After the recognition of an impairment on a financial asset classified as available for sale, increases in the fair value of equity instruments are reported in *Other comprehensive income*. For debt instruments, such increases in the fair value, up to amortized cost in the transaction currency, are recognized in *Other income,* provided that the fair value increase is related to an event occurring after the impairment loss was recorded. Increases in excess of that amount are reported in *Other comprehensive income*. ▲

h. Restructured and modified financial assets

When payment default is expected or where default has already occurred, UBS AG may grant concessions to borrowers in financial difficulties that it would otherwise not consider in the normal course of its business, such as preferential interest rates, extension of maturity, modifying the schedule of repayments, debt / equity swap, subordination, etc. When a concession or forbearance measure is granted, each case is considered individually and the exposure is generally classified as being in default. Forbearance classification will remain until the loan is collected or written off, non-preferential conditions are granted that supersede the preferential conditions or until the counterparty has recovered and the preferential conditions no longer exceed our risk tolerance.

Contractual adjustments when there is no evidence of imminent payment default, or where changes to terms and conditions are within UBS AG's usual risk tolerance, are not considered to be in forbearance. Modifications represent contractual amendments that result in an alteration of future contractual cash flows and that can occur within UBS AG's normal risk tolerance or as part of a credit restructuring where a counterparty is in financial difficulties.

A restructuring or modification of a financial asset could lead to a substantial change in the terms and conditions, resulting in the original financial asset being derecognized and a new financial asset being recognized. Where the modification does not result in a derecognition, any difference between the modified contractual cash flows discounted at the original EIR and the existing gross carrying amount of a financial asset is recognized in profit or loss as a modification gain or loss. Furthermore, the subsequent SICR assessment is made by comparing the risk of default at the reporting date based on the modified contractual terms of the financial asset with the risk of default at initial recognition based on the original, unmodified contractual terms of the financial asset.

Note 1 Summary of significant accounting policies (continued)

i. Offsetting

UBS AG nets financial assets and liabilities on its balance sheet if (i) it has the unconditional and legally enforceable right to set off the recognized amounts, both in the normal course of business and in the event of default, bankruptcy or insolvency of UBS AG and all of the counterparties, and (ii) intends either to settle on a net basis or to realize the asset and settle the liability simultaneously. Netted positions include, for example, certain derivatives and repurchase and reverse repurchase transactions with various counterparties, exchanges and clearing houses.

In assessing whether UBS AG intends to either settle on a net basis, or to realize the asset and settle the liability simultaneously, emphasis is placed on the effectiveness of operational settlement mechanics in eliminating substantially all credit and liquidity exposure between the counterparties. This condition precludes offsetting on the balance sheet for substantial amounts of UBS AG's financial assets and liabilities, even though they may be subject to enforceable netting arrangements. For OTC derivative contracts, balance sheet offsetting is generally only permitted in circumstances in which a market settlement mechanism exists via an exchange or central clearing counterparty that effectively accomplishes net settlement through a daily exchange of collateral via a cash margining process. For repurchase arrangements and securities financing transactions, balance sheet offsetting may be permitted only to the extent that the settlement mechanism eliminates, or results in insignificant, credit and liquidity risk, and processes the receivables and payables in a single settlement process or cycle.

→ **Refer to Note 25 for more information**

j. Hedge accounting

UBS AG uses derivative and non-derivative instruments to manage exposures to interest rate and foreign currency risks, including exposures arising from forecast transactions. UBS AG continues to apply hedge accounting requirements as set out in IAS 39. Qualifying instruments may be designated as hedging instruments in: (i) hedges of the change in fair value of recognized assets or liabilities (fair value hedges); (ii) hedges of the variability in future cash flows attributable to a recognized asset or liability or highly probable forecast transactions (cash flow hedges); or (iii) hedges of a net investment in a foreign operation (net investment hedges).

At the time a financial instrument is designated in a hedge relationship, UBS AG formally documents the relationship between the hedging instrument(s) and hedged item(s), including the risk management objectives and strategy in undertaking the hedge transaction and the methods that will be used to assess the effectiveness of the hedging relationship. Accordingly, UBS AG assesses, both at the inception of the hedge and on an ongoing basis, whether the hedging instruments, primarily derivatives, have been "highly effective" in offsetting changes in the fair value or cash flows associated with the designated risk of the hedged items.

A hedge is considered highly effective if the following criteria are met: (i) at inception of the hedge and throughout its life, the hedge is expected to be highly effective in achieving offsetting changes in fair value or cash flows attributable to the hedged risk; and (ii) actual results of the hedge are within a range of 80–125%. In the case of hedging forecast transactions, the transaction must have a high probability of occurring and must present an exposure to variations in cash flows that could ultimately affect the reported net profit or loss. UBS AG discontinues hedge accounting when: (i) it determines that a hedging instrument is not, or has ceased to be, highly effective as a hedge; (ii) the derivative expires or is sold, terminated or exercised; (iii) the hedged item matures, is sold or repaid; or (iv) forecast transactions are no longer deemed highly probable. UBS AG may also discontinue hedge accounting voluntarily.

Hedge ineffectiveness represents the amount by which the changes in the fair value of the hedging instrument differ from changes in the fair value of the hedged item attributable to the hedged risk, or the amount by which changes in the present value of future cash flows of the hedging instrument exceed changes in the present value of expected cash flows of the hedged item. Such ineffectiveness is recorded in current-period earnings in *Other net income from financial instruments measured at fair value through profit or loss* (prior to 1 January 2018: *Net trading income*).

Interest from derivatives designated as hedging instruments in effective fair value hedge relationships is presented within *Interest income from loans and deposits* and *Interest expense on debt issued*, within *Net interest income*. Interest from derivatives designated as hedging instruments in effective cash flow hedge relationships that is reclassified from other comprehensive income when the hedged transaction affects profit or loss is presented within *Interest income from derivative instruments designated as cash flow hedges*.

→ **Refer to Note 3 for more information**

Fair value hedges
For qualifying fair value hedges, the change in the fair value of the hedging instrument is recognized in the income statement along with the change in the fair value of the hedged item that is attributable to the hedged risk. In fair value hedges of interest rate risk, the fair value change of the hedged item attributable to the hedged risk is reflected as an adjustment to the carrying amount of the hedged item. If the hedge accounting relationship is terminated for reasons other than the derecognition of the hedged item, the adjustment to the carrying amount is amortized to the income statement over the remaining term to maturity of the hedged item using the effective interest rate method. For a portfolio hedge of interest rate risk, the equivalent change in fair value is reflected within *Other financial assets measured at amortized cost* or *Other financial liabilities measured at amortized cost*. If the portfolio hedge relationship is terminated for reasons other than the derecognition of the hedged item, the amount included in *Other financial assets measured at amortized cost* or *Other financial liabilities measured at amortized cost* is amortized to the income statement over the remaining term to maturity of the hedged items using the straight-line method.

Cash flow hedges
Fair value gains or losses associated with the effective portion of derivatives designated as cash flow hedges for cash flow repricing risk are recognized initially in *Other comprehensive income* within *Equity*. When the hedged forecast cash flows affect profit or loss, the associated gains or losses on the hedging derivatives are reclassified from *Equity* to the income statement.

If a cash flow hedge of forecast transactions is no longer considered effective, or if the hedge relationship is terminated, the cumulative gains or losses on the hedging derivatives previously reported in *Equity* remain there until the committed or forecast transactions occur and affect profit or loss. If the forecast transactions are no longer expected to occur, the deferred gains or losses are reclassified immediately to the income statement.

Hedges of net investments in foreign operations
Hedges of net investments in foreign operations are accounted for similarly to cash flow hedges. Gains or losses on the hedging instrument relating to the effective portion of the hedge are recognized directly in *Equity* (and presented in the statement of changes in equity and statement of comprehensive income under *Foreign currency translation*), while any gains or losses relating to the ineffective and/or undesignated portion (for example, the interest element of a forward contract) are recognized in the income statement. Upon disposal or partial disposal of the foreign operation, the cumulative value of any such gains or losses recognized in *Equity* associated with the entity is reclassified to *Other income*.

Economic hedges that do not qualify for hedge accounting
Derivative instruments that are transacted as economic hedges but do not qualify for hedge accounting are treated in the same way as derivative instruments used for trading purposes; i.e., realized and unrealized gains and losses are recognized in *Other net income from financial instruments measured at fair value through profit or loss* (prior to 1 January 2018: *Net trading income*), except for the forward points on certain short- and long-duration foreign exchange contracts, which are reported in *Net interest income*.

→ **Refer to Note 11 for more information**

k. Embedded derivatives in financial liabilities
Derivatives may be embedded in other financial instruments (host contracts). For example, they could be represented by the conversion feature embedded in a convertible bond. Such hybrid instruments arise predominantly from the issuance of certain structured debt instruments. An embedded derivative in a financial liability is generally required to be separated from the host contract and accounted for as a standalone derivative instrument at fair value through profit or loss if: (i) the host contract is not measured at fair value with changes in fair value reported in the income statement; (ii) the economic characteristics and risks of the embedded derivative are not closely related to the economic characteristics and risks of the host contract; and (iii) the terms of the embedded derivative would meet the definition of a standalone derivative, were they contained in a separate contract.

Typically, UBS AG applies the fair value option to hybrid instruments (refer to item 3b in this Note for more information), in which case bifurcation of an embedded derivative component is not required.

l. Financial liabilities
Financial liabilities measured at amortized cost include *Debt issued measured at amortized cost* and *Funding from UBS Group AG and its subsidiaries*, which constitute obligations of UBS AG arising from funding it has received from UBS Group AG or its subsidiaries, which are not within the UBS AG's scope of consolidation. The latter includes contingent capital instruments issued to UBS Group AG and its subsidiaries that contain contractual provisions under which the principal amounts would be written down upon either a specified CET1 ratio breach or a determination by FINMA that a viability event has occurred. Such contractual provisions are not derivatives as the underlying is deemed to be a non-financial variable specific to a party to the contract. Where there is a legal bail-in mechanism for write-down or conversion into equity (as is the case, for instance, with senior unsecured debt issued by UBS AG that is subject to write-down or conversion under resolution authority granted to FINMA under Swiss law), such a mechanism does not form part of the contractual terms and, therefore, does not affect the amortized cost accounting treatment applied to these instruments. If the debt were to be written down or converted into equity in a future period, the financial liability would be partially or fully derecognized, with the difference between the carrying amount of the debt written down or converted into equity and the fair value of any equity shares issued recognized in the income statement.

Note 1 Summary of significant accounting policies (continued)

In cases where, as part of UBS AG's risk management activity, fair value hedge accounting is applied to fixed-rate debt instruments measured at amortized cost, their carrying amount is adjusted for changes in fair value related to the hedged exposure. Refer to item 3j for more information about hedge accounting.

Debt issued and subsequently repurchased in relation to market-making or other activities is treated as redeemed. A gain or loss on redemption (depending on whether the repurchase price of the bond is lower or higher than its carrying amount) is recorded in *Other income*. A subsequent sale of own bonds in the market is treated as a reissuance of debt.

UBS AG uses the fair value option to designate certain issued debt instruments as financial liabilities designated at fair value through profit or loss, on the basis that such financial instruments include embedded derivatives and/or are managed on a fair value basis (refer to item 3b in this Note for more information).

m. Own credit

Changes in the fair value of financial liabilities designated at fair value through profit or loss related to own credit are recognized in *Other comprehensive income* directly within *Retained earnings* and will not be reclassified to the income statement in future periods.

n. Loan commitments

Policy applicable from 1 January 2018[1]

Loan commitments are arrangements under which clients can borrow stipulated amounts under defined terms and conditions.

Loan commitments that can be canceled at any time by UBS AG at its discretion are neither recognized on the balance sheet nor included in off-balance sheet disclosures.

Loan commitments that cannot be canceled by UBS AG once the commitments have been communicated to the beneficiary or that are revocable only because of automatic cancelation upon deterioration in a borrower's creditworthiness are considered irrevocable and are classified as: (i) derivative loan commitments measured at fair value through profit or loss; (ii) loan commitments designated at fair value through profit or loss; or (iii) other loan commitments.

UBS AG recognizes ECL on non-cancelable other loan commitments and those that can be canceled at any time if UBS AG is exposed to credit risk (refer to item 3g in this Note). Corresponding ECL are presented within *Provisions* on UBS AG's balance sheet. ECL relating to these other loan commitments are recorded in the income statement in *Credit loss (expense) / recovery*.

When a client draws on a commitment, the resulting loan is presented within *Financial assets at fair value held for trading,* or within *Financial assets at fair value not held for trading* when the associated loan commitments are measured at fair value through profit or loss, and within *Loans and advances to customers* when the associated loan commitment is not measured at fair value through profit or loss.

Comparative policy | *Policy applicable prior to 1 January 2018*

When a client draws on a commitment, the resulting loan is classified as a: (i) trading asset, consistent with the associated derivative loan commitment; (ii) financial asset designated at fair value through profit or loss, consistent with the loan commitment designated at fair value through profit or loss; or as a (iii) loan when the associated loan commitment is accounted for as other loan commitments which are not measured at fair value through profit or loss. Consistent with item 3g above, claims under other loan commitments are impaired and an allowance or provision for credit losses is recognized when objective evidence demonstrates that a loss event has occurred after the initial recognition and that the loss event has an effect on the future cash flows that can be reliably estimated (incurred loss approach).▲

o. Financial guarantee contracts

Policy applicable from 1 January 2018[1]

Financial guarantee contracts are contracts that require the issuer to make specified payments to reimburse the holder for an incurred loss because a specified debtor fails to make payments when due in accordance with the terms of a specified debt instrument. UBS AG issues such financial guarantees to banks, financial institutions and other parties on behalf of clients to secure loans, overdrafts and other banking facilities.

1 The accounting policy in this section applies from 1 January 2018, the effective date of IFRS 9.

Certain issued financial guarantees that are managed on a fair value basis are designated at fair value through profit or loss. Financial guarantees that are not managed on a fair value basis are initially recognized in the financial statements at fair value and are subsequently measured at the higher of:

– the amount of ECL (refer to item 3g in this Note); and
– the amount initially recognized less the cumulative amount of income recognized as of the reporting date.

ECL resulting from guarantees is recorded in the income statement in *Credit loss (expense) / recovery*.

Comparative policy | *Policy applicable prior to 1 January 2018*
Financial guarantees that are not managed on a fair value basis are initially recognized in the financial statements at fair value and are subsequently measured at the higher of the amount initially recognized less cumulative amortization and, to the extent a payment under the guarantee has become probable, the present value of the expected payment. Any change in the liability relating to probable expected payments resulting from guarantees is recorded in the income statement in *Credit loss (expense) / recovery*. ▲

p. Other net income from financial instruments measured at fair value through profit or loss

The line item *Other net income from financial instruments measured at fair value through profit or loss* includes fair value gains and losses on financial instruments at fair value through profit or loss other than interest income and expense on non-derivatives (refer to item 3c in this Note). In addition, effective 1 January 2019, the line item includes dividends (prior to 1 January 2019, dividends were included within *Net interest income*), intermediation income arising from certain client-driven Global Wealth Management and Personal & Corporate Banking financial transactions, foreign currency translation effects and income and expenses from exposures to precious metals.

4) Fee and commission income and expenses

Policy applicable from 1 January 2018[1]
UBS AG earns fee income from a diverse range of services it provides to its clients. Fee income can be divided into two broad categories: fees earned from services that are provided over a certain period of time, such as asset or portfolio management, custody services and certain advisory services; and fees earned from point-in-time services, such as underwriting fees and brokerage fees (e.g., securities and derivative execution and clearing).

→ **Refer to Note 4 for more information, including the disaggregation of revenues**

Performance obligations satisfied over time

Fees earned from services that are provided over a certain period of time are recognized on a pro rata basis over the service period, provided the fees are not contingent on successfully meeting specified performance criteria that are beyond the control of UBS AG (see measurement below).

Costs to fulfill services over time are recorded in the income statement immediately, because such services are considered to be a series of services that are substantially the same from day to day and have the same pattern of transfer. The costs to fulfill neither generate nor enhance the resources of UBS AG that will be used to satisfy future performance obligations and cannot be distinguished between those that relate to satisfied and unsatisfied performance obligations. Therefore, these costs do not qualify to be recognized as an asset. Where costs incurred relate to contracts that include variable consideration that is constrained by factors beyond UBS AG's control (e.g., successful mergers and acquisitions (M&A) activity), or where UBS AG has a history of not recovering such costs on similar transactions, such costs are expensed immediately as incurred.

Performance obligations satisfied at a point in time

Fees earned from providing transaction-type services are recognized when the service has been completed, provided such fees are not subject to refund or another contingency beyond the control of UBS AG.

Incremental costs to fulfill services provided at a point in time are typically incurred and recorded at the same time as the performance obligation is satisfied and revenue is earned, and are therefore not recognized as an asset, e.g., brokerage. Where recovery of costs to fulfill relates to an uncompleted point-in-time service for which the satisfaction of the performance obligation in the contract is dependent upon factors beyond the control of UBS AG, such as underwriting a successful securities issuance, or where UBS AG has a history of not recovering such costs through reimbursement on similar transactions, the costs are expensed immediately as incurred.

1 The accounting policy in this section applies from 1 January 2018, the effective date of IFRS 15.

Note 1 Summary of significant accounting policies (continued)

Measurement

Fee and commission income is measured based on consideration specified in a legally enforceable contract with a customer, excluding amounts such as taxes collected on behalf of third parties. Consideration can include both fixed and variable amounts. Variable consideration includes refunds, discounts, performance bonuses and other amounts that are contingent on the occurrence or non-occurrence of a future event. Variable consideration that is contingent on an uncertain event can only be recognized to the extent that it is highly probable that a significant reversal in the amount of cumulative revenue for a contract will not occur. This is referred to as the variable consideration constraint. UBS AG does not consider the highly probable criterion to be met where the contingency on which income is dependent is beyond the control of UBS.AG In such circumstances, UBS AG only recognizes revenue when the contingency has been resolved or an uncertain event has occurred. Examples include asset management performance-linked fees, which are only payable if the returns of a fund exceed a benchmark and are only recognized after the performance period has elapsed. Similarly, M&A advisory fees that are dependent on a successful client transaction are not recognized until the transaction on which the fees are dependent has been executed. Asset management fees (excluding performance-based fees) received on a periodic basis, typically quarterly, that are determined based on a fixed percentage of net asset value that has not been established at the reporting date, are estimated and accrued ratably over the period to the next invoice date, except during periods in which market volatility indicates there is a risk of significant reversal. Research revenues earned by the Investment Bank under commission-sharing or research payment account agreements are not recognized until the client has provided a definitive allocation of amounts between research providers, as prior to this UBS AG generally does not have an enforceable right to a specified amount of consideration.

Consideration received is allocated to the separately identifiable performance obligations in a contract. Owing to the nature of UBS AG's business, contracts that include multiple performance obligations are typically those that are considered to include a series of similar performance obligations fulfilled over time with the same pattern of transfer to the client, e.g., asset management. As a consequence, UBS AG is not required to apply significant judgment in allocating the consideration received across the various performance obligations. UBS AG has taken the practical expedient to not disclose information about the allocation of the transaction price to remaining performance obligations in contracts. This is because contracts are typically less than one year in duration. Where contracts have a longer duration, they are either subject to the variable consideration constraint, with fees calculated on future net asset value, which cannot be included within the transaction price for the contract, or result in revenue being recognized ratably using the output method corresponding directly to the value of the services completed to date and to which UBS AG would be entitled to invoice upon termination of the contract, e.g., loan commitments.

Presentation of fee and commission income and expense

Fee and commission income and expense are presented gross on the face of the income statement when UBS AG is considered to be principal in the contractual relationship with its customer and any suppliers used to fulfill such contracts. This occurs where UBS AG has control over such services and its relationship with suppliers prior to provision of the service to the client. UBS AG only considers itself to be an agent in relation to services provided by third parties, e.g., third-party execution costs for exchange-traded derivatives and fees payable to third-party research providers, where the client controls both the choice of supplier and the scope of the services to be provided. Furthermore, in order to be considered an agent UBS AG should generally not take responsibility for the quality of the service, transform or integrate the services into a UBS AG product. In such circumstances, UBS AG is essentially acting as a payment agent for its client. When UBS AG is acting as an agent, any costs incurred are directly offset against the associated income.

Presentation of expenses in the income statement

UBS AG presents expenses primarily in line with their nature in the income statement, differentiating between expenses that are directly attributable to the satisfaction of specific performance obligations associated with the generation of revenues, which are presented within *Total operating income*, and those that are related to personnel, general and administrative expenses, which are presented within *Total operating expenses*.

Contract assets, contract liabilities and capitalized expenses

UBS AG has applied the practical expedient of allowing for costs incurred to obtain a contract to be expensed as incurred where the amortization period for any asset recognized would be less than 12 months.

Where UBS AG provides services to clients, consideration is due immediately upon satisfaction of a point-in-time service or at the end of a prespecified period for a service performed over time; e.g., certain asset management fees are collected monthly or quarterly, through deduction from a client account, deduction from fund assets or through separate invoicing. Where receivables are recorded, they are presented within *Other financial assets measured at amortized cost*.

Contract liabilities relate to prepayments received from customers where UBS AG is yet to satisfy its performance obligation.

Contract assets are recorded when an entity's right to consideration in exchange for services transferred is conditional on something other than the passage of time, e.g., the entity's future performance.

UBS AG has not recognized any material contract assets, contract liabilities or capitalized expenses during the period and has therefore not provided a contract balances reconciliation.

Comparative policy I *Policy applicable prior to 1 January 2018*
Fees earned from services that are provided over a certain period of time are recognized ratably over the service period, with the exception of performance-linked fees or fee components with specific performance criteria. Such fees are recognized when, as of the reporting date, the performance benchmark has been met and when collectibility is reasonably assured.

Fees earned from providing transaction-type services are recognized when the service has been completed and the fee is fixed or determinable, i.e., not subject to refund or adjustment.

Fee income generated from providing a service that does not result in the recognition of a financial instrument is presented within *Net fee and commission income*. Fees generated from the acquisition, issue or disposal of a financial instrument are presented in the income statement in line with the balance sheet classification of that financial instrument. ▲

→ **Refer to Note 4 for more information**

5) Cash and cash equivalents

For the purpose of the statement of cash flows, cash and cash equivalents comprise balances with an original maturity of three months or less, including cash, money market paper and balances at central and other banks.

6) Share-based and other deferred compensation plans

Share-based compensation plans

UBS Group AG is the grantor of and maintains the obligation to settle share-based compensation plans that are awarded to employees of UBS AG. As a consequence, UBS AG classifies the awards of UBS Group AG shares as equity-settled share-based payment transactions. UBS AG recognizes the fair value of awards granted to its employees by reference to the fair value of UBS Group AG's equity instruments on the date of grant, taking into account the terms and conditions inherent in the award, including, where relevant, dividend rights, transfer restrictions in effect beyond the vesting date, market conditions, and non-vesting conditions. These awards are generally subject to vesting conditions that require employees to complete a specified period of service and, for performance shares, to satisfy specified performance conditions. Share-based compensation expense is recognized, on a per-tranche basis, over the service period based on an estimate of the number of instruments expected to vest and is adjusted to reflect actual outcomes of service or performance conditions. Where the vesting period is shortened, for example in the case of employees affected by restructuring programs or mutually agreed termination provisions, the expense is recognized on an accelerated basis to the termination date.

Where no future service is required, such as for employees who are eligible for retirement or who have met certain age and length-of-service criteria, the services are presumed to have been received and the share-based compensation expense is recognized immediately on, or prior to, the date of grant. Such awards may remain forfeitable. For equity-settled awards, forfeiture events resulting from a breach of a non-vesting condition (i.e., one that does not relate to a service or performance condition) do not result in an adjustment to the share-based compensation expense.

The fair value is not remeasured unless the terms of the award are modified such that there is an incremental increase in value. No adjustments are made for modifications that result in a decrease in value. The equity effects in UBS AG that arise from recognizing UBS Group AG share-based compensation plans are offset through a recharge from UBS Group AG to UBS AG and its subsidiaries.

→ **Refer to Note 30 for more information**

Other compensation plans

The employees of UBS AG are granted deferred compensation plans that are settled in cash or other financial instruments, the amount of which may be fixed or may vary based on the achievement of specified performance conditions or the value of specified underlying assets. Compensation expense is recognized over the period that the employee provides services to become entitled to the award. Where the service period is shortened, for example in the case of employees affected by restructuring programs or mutually agreed termination provisions, recognition of expense is accelerated to the termination date. Where no future service is required, such as for employees who are eligible for retirement or who have met certain age and length-of-service criteria, the services are presumed to have been received and compensation expense is recognized immediately on, or prior to, the date of grant. The amount recognized is based on the present value of the amount expected to be paid under the plan and is remeasured at each reporting date, so that the cumulative expense recognized equals the cash or the fair value of respective financial instruments distributed.

→ **Refer to Note 30 for more information**

7) Pension and other post-employment benefit plans

UBS AG sponsors various post-employment benefit plans for its employees worldwide, which include defined benefit and defined contribution pension plans, and other post-employment benefits, such as medical and life insurance benefits that are payable after the completion of employment.

→ **Refer to Note 29 for more information**

Note 1 Summary of significant accounting policies (continued)

Defined benefit plans

UBS AG offers defined benefit plans, such as pension and medical insurance benefit plans. Defined benefit plans specify an amount of benefit that an employee will receive, which usually depends on one or more factors, such as age, years of service and compensation. The defined benefit liability recognized in the balance sheet is the present value of the defined benefit obligation less the fair value of the plan assets at the balance sheet date, with changes resulting from remeasurements recorded immediately in *Other comprehensive income*. If the fair value of the plan assets is higher than the present value of the defined benefit obligation, the recognition of the resulting net defined benefit asset is limited to the present value of economic benefits available in the form of refunds from the plan or reductions in future contributions to the plan. UBS AG applies the projected unit credit method to determine the present value of its defined benefit obligations, the related current service cost and, where applicable, past service cost. The projected unit credit method sees each period of service as giving rise to an additional unit of benefit entitlement and measures each unit separately to build up the final obligation. These amounts, which take into account the specific features of each plan, including risk sharing between employee and employer, are calculated periodically by independent qualified actuaries.

Critical accounting estimates and judgments

The net defined benefit liability or asset at the balance sheet date and the related personnel expense depend on the expected future benefits to be provided, determined using a number of economic and demographic assumptions. A range of assumptions could be applied, and different assumptions could significantly alter the defined benefit liability or asset and pension expense recognized. The most significant assumptions include life expectancy, the discount rate, expected salary increases, pension increases and, in addition for the Swiss plan and one of the US defined benefit pension plans, interest credits on retirement savings account balances. Life expectancy is determined by reference to published mortality tables. The discount rate is determined by reference to the rates of return on high-quality fixed-income investments of appropriate currency and term at the measurement date. The assumption for salary increases reflects the long-term expectations for salary growth and takes into account historical salary development by age groups, expected inflation and expected supply and demand in the labor market. A sensitivity analysis for reasonable possible movements in each significant assumption for UBS AG's post-employment obligations is provided within Note 29.

Defined contribution plans

A defined contribution plan is a pension plan under which UBS AG pays fixed contributions into a separate entity from which post-employment and other benefits are paid. UBS AG has no legal or constructive obligation to pay further contributions if the plan does not hold sufficient assets to pay employees the benefits relating to employee service in the current and prior periods. UBS AG's contributions are expensed when the employees have rendered services in exchange for such contributions. This is generally in the year of contribution. Prepaid contributions are recognized as an asset to the extent that a cash refund or a reduction in future payments is available.

8) Income taxes

UBS AG is subject to the income tax laws of Switzerland and those of the non-Swiss jurisdictions in which UBS AG has business operations.

UBS AG's provision for income taxes is composed of current and deferred taxes. Current income taxes represent taxes to be paid or refunded for the current period or previous periods.

Deferred taxes are recognized for temporary differences between the carrying amounts and tax bases of assets and liabilities that will result in taxable or deductible amounts in future periods and are measured using the applicable tax rates and laws that have been enacted or substantively enacted by the end of the reporting period and which will be in effect when such differences are expected to reverse.

Deferred tax assets arise from a variety of sources, the most significant being: (i) tax losses that can be carried forward to be used against profits in future years; and (ii) temporary differences that will result in deductions against profits in future years. Deferred tax assets are recognized only to the extent that it is probable that sufficient taxable profits will be available against which these differences can be used. When an entity or tax group has a history of recent losses, deferred tax assets are only recognized to the extent there are sufficient taxable temporary differences or there is convincing other evidence that sufficient taxable profit will be available against which the unused tax losses can be utilized.

Deferred tax liabilities are recognized for temporary differences between the carrying amounts of assets and liabilities in the balance sheet that reflect the expectation that certain items will give rise to taxable income in future periods.

Deferred and current tax assets and liabilities are offset when: (i) they arise in the same tax reporting group; (ii) they relate to the same tax authority; (iii) the legal right to offset exists; and (iv) they are intended to be settled net or realized simultaneously.

Current and deferred taxes are recognized as income tax benefit or expense in the income statement, except for current and deferred taxes recognized: (i) upon the acquisition of a subsidiary (for which such amounts would affect the amount of goodwill arising from the acquisition); (ii) for gains and losses on the sale of treasury shares (for which the tax effects are recognized directly in *Equity*); (iii) for unrealized gains or losses on financial instruments that are classified at FVOCI (prior to 1 January 2018: financial assets classified as available for sale); (iv) for changes in fair value of derivative instruments designated as cash flow hedges; (v) for remeasurements of defined benefit plans; or (vi) for certain foreign currency translations of foreign operations. Amounts relating to points (iii) through (vi) are recognized in *Other comprehensive income* within *Equity*.

UBS AG reflects the potential effect of uncertain tax positions for which acceptance by the relevant tax authority is not considered probable by adjusting current or deferred taxes, as applicable, using either the most likely amount or expected value methods, depending on which method is deemed a better predictor of the basis on which and extent to which the uncertainty will be resolved.

Critical accounting estimates and judgments

Tax laws are complex, and judgment and interpretations about the application of such laws are required when accounting for income taxes. UBS AG considers the performance of its businesses and the accuracy of historical forecasts and other factors in evaluating the recoverability of its deferred tax assets, including the remaining tax loss carry-forward period, and its assessment of expected future taxable profits in the forecast period used for recognizing deferred tax assets. Estimating future profitability is inherently subjective and is particularly sensitive to future economic, market and other conditions, which are difficult to predict.

The level of deferred tax asset recognition is influenced by management's assessment of UBS AG's future profitability based on relevant business plan forecasts. Existing assessments are reviewed and, if necessary, revised to reflect changed circumstances. This review is conducted annually, generally in the fourth quarter of each year, but adjustments may be made at other times, if required. In a situation where recent losses have been incurred, convincing other evidence that there will be sufficient future profitability is required.

If profit forecast assumptions in future periods deviate from the current outlook, the value of UBS AG's deferred tax assets may be affected. Any increase or decrease in the carrying amount of deferred tax assets would primarily be recognized through the income statement but would not affect cash flows.

In addition, judgment is required to assess the expected value of uncertain tax positions that are incorporated into the estimate of income and deferred tax and the assessment of the related probabilities, including in relation to the interpretation of tax laws, the resolution of any income tax-related appeals or litigation and the assessment of the related probabilities.

→ **Refer to Note 8 for more information**

9) Investments in associates

Interests in entities where UBS AG has significant influence over the financial and operating policies of the entity, but does not have control, are classified as investments in associates and accounted for under the equity method of accounting. Typically, UBS AG has significant influence when it holds or has the ability to hold between 20% and 50% of a company's voting rights. Investments in associates are initially recognized at cost, and the carrying amount is increased or decreased after the date of acquisition to recognize UBS AG's share of the investee's comprehensive income and any impairment losses.

The net investment in an associate is impaired if there is objective evidence of a loss event and the carrying amount of the investment in the associate exceeds its recoverable amount.

→ **Refer to Note 31 for more information**

10) Property, equipment and software

Property, equipment and software includes own-used properties, leasehold improvements, information technology hardware, externally purchased and internally generated software, as well as communication and other similar equipment. Property, equipment and software is measured at cost less accumulated depreciation and impairment losses and is reviewed at each reporting date for indication for impairment. Software development costs are capitalized only when the costs can be measured reliably and it is probable that future economic benefits will arise. Depreciation of property, equipment and software begins when they are available for use (i.e., when they are in the location and condition necessary for them to be capable of operating in the manner intended by management). Depreciation is calculated on a straight-line basis over an asset's estimated useful life. The estimated useful economic lives of UBS AG's property, equipment and software are:

– properties, excluding land: ≤ 67 years
– IT hardware and communication equipment: ≤ 7 years
– other machines and equipment: ≤ 10 years
– software: ≤ 10 years
– leased properties and leasehold improvements: the shorter of the lease term or the economic life of asset (typically ≤ 20 years).

Note 1 Summary of significant accounting policies (continued)

Property, equipment and software are generally tested for impairment at the appropriate cash-generating unit (CGU) level, alongside goodwill and intangible assets as described in item 11 of this Note. An impairment charge is however only recognized for such assets if both the asset's fair value less costs of disposal and value in use (if determinable) is below its carrying amount. The fair value of such an asset, other than property which has a market price, is generally determined using a replacement cost approach that reflects the amount that would be currently required by a market participant to replace the service capacity of the asset. If such assets are no longer used, they are tested individually for impairment.

→ **Refer to Note 15 for more information**

11) Goodwill and intangible assets

Goodwill represents the excess of the cost of an acquisition over the fair value of UBS AG's share of net identifiable assets of the acquired entity at the date of the acquisition. Goodwill is not amortized, but at the end of each reporting period or when indicators of impairment exist, UBS AG assesses whether there is any indication that goodwill is impaired. If such indicators exist, UBS AG is required to test the goodwill for impairment. Irrespective of whether there is any indication of impairment, UBS AG tests goodwill for impairment annually.

Following the integration in 2018 of the Wealth Management and Wealth Management Americas business divisions into the single reportable segment Global Wealth Management, UBS AG continued to separately monitor the goodwill previously allocated to the two former business divisions. As a consequence, for the purpose of goodwill impairment testing, the former Wealth Management and Wealth Management Americas business divisions are considered to be two separate cash-generating units referred to in Note 16 as Global Wealth Management Americas and Global Wealth Management ex Americas. The remaining goodwill balances are tested at the level of Asset Management and the Investment Bank, with each segment considered a separate cash-generating unit.

The impairment test is performed for each cash-generating unit to which goodwill is allocated by comparing the recoverable amount, based on its value-in-use, to the carrying amount of the respective cash-generating unit. An impairment charge is recognized in the income statement if the carrying amount exceeds the recoverable amount.

If the estimated earnings and other assumptions in future periods deviate from the current outlook, the value of UBS AG's goodwill may become impaired in the future, giving rise to losses in the income statement. Recognition of any impairment of goodwill would reduce net profit and equity, but would not affect cash flows.

Intangible assets are comprised of separately identifiable intangible items arising from business combinations and certain purchased trademarks and similar items. Intangible assets are recognized at cost. The cost of an intangible asset acquired in a business combination is its fair value at the date of acquisition. Intangible assets with a finite useful life are amortized using the straight-line method over their estimated useful life, generally not exceeding 20 years. In rare cases, intangible assets can have an indefinite useful life, in which case they are not amortized. At each reporting date, intangible assets are reviewed for indications of impairment. If such indications exist, the intangible assets are analyzed to assess whether their carrying amount is fully recoverable. An impairment loss is recognized if the carrying amount exceeds the recoverable amount.

Critical accounting estimates and judgments

UBS AG's methodology for goodwill impairment testing is based on a model that is most sensitive to the following key assumptions: (i) forecasts of earnings available to shareholders in years one to three; (ii) changes in the discount rates; and (iii) changes in the long-term growth rate.

The key assumptions are linked to external market information, where applicable. Earnings available to shareholders are estimated on the basis of forecast results, which are part of the business plan approved by the BoD. The discount rates are determined by applying a capital asset pricing model-based approach, as well as considering quantitative and qualitative inputs from both internal and external analysts, the view of management and regional differences in risk-free rates, at the level of individual cash-generating units. Long-term growth rates are determined in a consistent manner based on nominal or real GDP growth rate forecasts, considering different regions worldwide as incorporated in the business plan approved by the BoD.

The key assumptions used to determine the recoverable amounts of each cash-generating unit are tested for sensitivity by applying reasonably possible changes to those assumptions. Refer to Note 16 for details about how the reasonably possible changes may affect the results of UBS AG's model for goodwill impairment testing.

→ **Refer to Notes 2 and 16 for more information**

12) Provisions and contingent liabilities

Provisions are liabilities of uncertain timing or amount, and are generally recognized in accordance with IAS 37, *Provisions, Contingent Liabilities and Contingent Assets*, when: (i) UBS AG has a present obligation as a result of a past event; (ii) it is probable that an outflow of resources will be required to settle the obligation; and (iii) a reliable estimate of the amount of the obligation can be made.

UBS AG recognizes IAS 37 provisions for litigation, regulatory and similar matters when, in the opinion of management after seeking legal advice, the requirements for recognition have been met. A provision may also be established for claims that have not yet been asserted against UBS AG, but are nevertheless expected to be, based on UBS AG experience with similar asserted claims.

IAS 37 provisions are measured considering the best estimate of the consideration required to settle the present obligation at the balance sheet date. Such estimates are based on all available information and are revised over time as more information becomes available. If the effect of the time value of money is material, provisions are discounted and measured at the present value of the expenditure expected to settle or discharge the obligation, using a rate that reflects the current market assessments of the time value of money and the risks specific to the obligation.

Provisions that are similar in nature are aggregated to form a class, while the remaining provisions, including those of less significant amounts, are disclosed under *Other provisions*. Provisions are presented separately on the balance sheet and, when they are no longer considered uncertain in timing or amount, are reclassified to their respective liability lines depending on their nature.

When all conditions required to recognize a provision are not met, a contingent liability is disclosed, unless the likelihood of an outflow of resources is remote. Contingent liabilities are also disclosed for possible obligations that arise from past events whose existence will be confirmed only by uncertain future events not wholly within the control of UBS AG. Such disclosures are not made if it is not practicable to do so.

The majority of UBS AG's provisions relate to litigation, regulatory and similar matters, restructuring, and employee benefits. Restructuring provisions are generally recognized as a consequence of management agreeing to materially change the scope of the business or the manner in which it is conducted, including changes in the management structure. Provisions for employee benefits relate mainly to service anniversaries and sabbatical leave, and are recognized in accordance with measurement principles set out in item 7 of this Note. In addition, UBS AG presents expected credit loss allowances within *Provisions* if they relate to a loan commitment, financial guarantee contract or a revolving revocable credit line.

Critical accounting estimates and judgments

Recognition of provisions often involves significant judgment in assessing the existence of an obligation that results from past events and in estimating the probability, timing and amount of any outflows of resources. This is particularly the case for litigation, regulatory and similar matters, which, due to their nature, are subject to many uncertainties making their outcome difficult to predict. Such matters may involve unique fact patterns or novel legal theories, proceedings that have not yet been initiated or are at early stages of adjudication, or as to which alleged damages have not been quantified by the claimants. Determining whether an obligation exists as a result of a past event and estimating the probability, timing and amount of any potential outflows is based on a variety of assumptions, variables, and known and unknown uncertainties.

The amount of any provision recognized is sensitive to the assumptions used and there could be a wide range of possible outcomes for any particular matter.

Statistical or other quantitative analytical tools are generally of limited use in determining whether to establish or determine the amount of provisions in the case of litigation, regulatory or similar matters. Furthermore, information currently available to management may be incomplete or inaccurate, increasing the risk of erroneous assumptions with regard to the future development of such matters. Management regularly reviews all the available information regarding such matters, including legal advice, which is a significant consideration, to assess whether the recognition criteria for provisions have been satisfied and to determine the timing and amount of any potential outflows.

→ **Refer to Note 21 for more information**

13) Foreign currency translation

Transactions denominated in a foreign currency are translated into the functional currency of the reporting entity at the spot exchange rate on the date of the transaction. At the balance sheet date, all monetary assets, including those at FVOCI (prior to 1 January 2018: monetary financial assets classified as available for sale), and monetary liabilities denominated in foreign currency are translated into the functional currency using the closing exchange rate. Translation differences (which for monetary financial assets at FVOCI are determined as if they were financial assets measured at amortized cost) are reported in *Other net income from financial instruments measured at fair value through profit or loss* (prior to 1 January 2018: *Net trading income*).

Non-monetary items measured at historical cost are translated at the exchange rate on the date of the transaction. Prior to 1 January 2018, foreign currency translation differences on non-monetary financial assets classified as available for sale were recorded directly in *Equity* until the asset was derecognized.

Note 1 Summary of significant accounting policies (continued)

Upon consolidation, assets and liabilities of foreign operations (which from 1 October 2018 also include UBS AG's Switzerland-based operations with Swiss franc functional currency) are translated into US dollars, UBS AG's presentation currency, at the closing exchange rate on the balance sheet date, and income and expense items and other comprehensive income are translated at the average rate for the period. The resulting foreign currency translation differences attributable to shareholders are recognized in *Foreign currency translation* within *Equity,* which forms part of *Total equity attributable to shareholders*, whereas the foreign currency translation differences attributable to non-controlling interests are included within *Equity attributable to non-controlling interests*. Share capital issued, share premium and treasury shares held are translated at the historic average rate, whereby the difference between the historic average rate and the spot rate realized upon repayment of share capital or disposal of treasury shares is reported as *Share premium.* Cumulative amounts recognized in OCI in respect of cash flow hedges and financial assets measured at FVOCI (prior to 1 January 2018: financial assets classified as available for sale) are translated at the closing exchange rate as of the balance sheet dates, with any translation effects adjusted through *Retained earnings*.

When a foreign operation is disposed or partially disposed of and UBS AG no longer controls the foreign operation, the cumulative amount of foreign currency translation differences within *Total equity attributable to shareholders* and *Equity attributable to non-controlling interests* related to that foreign operation is reclassified to the income statement as part of the gain or loss on disposal. Similarly, if an investment in an associate becomes an investment in a subsidiary, the cumulative amount of foreign currency translation differences is reclassified to profit or loss. When UBS AG disposes of a portion of its interest in a subsidiary that includes a foreign operation but retains control, the related portion of the cumulative currency translation balance is reclassified to *Equity attributable to non-controlling interests*.

→ **Refer to Note 37 for more information**

Critical accounting estimates and judgments

The determination of an entity's functional currency and the trigger for a change requires management to apply significant judgment and assumptions. IAS 21, *The Effects of Changes in Foreign Exchange Rates*, requires management to consider the underlying transactions, events and conditions that are relevant to the entity when determining the appropriate functional currency and any changes. UBS AG's conclusion, in the fourth quarter of 2018, that the functional currency of UBS AG's Head Office in Switzerland and UBS AG London Branch had changed from the Swiss franc to the US dollar was based on a detailed assessment of the primary currencies affecting and influencing the economics of each entity, considering revenue-generating income streams, expenses, funding and risk management activities.

In addition, determining the earliest date from which it is practicable to perform a restatement following a voluntary change in presentational currency also requires management to apply significant judgment and make estimates and assumptions. UBS AG's decision in 2018 to change the presentation currency of its consolidated financial statements from the Swiss franc to the US dollar was made in line with IAS 8, *Accounting Policies, Changes in Accounting Estimates and Errors*, by assessing the earliest date from which it was practicable to perform a restatement, taking into consideration whether sufficiently reliable data was available for earlier periods and whether any assumptions on management intent or significant estimates of amounts were required. UBS AG carried out a detailed and extensive data analysis before concluding that 1 January 2004 represented the earliest date available, with the consequence that foreign currency translation gains and losses prior to 2004 were disregarded, and foreign currency translation effects were first calculated from 1 January 2004 onward.

14) Non-controlling interests and preferred noteholders

Non-controlling interests and preferred noteholders

Net profit is split into *Net profit attributable to shareholders, Net profit attributable to non-controlling interest and Net profit attributable to preferred noteholders.* Similarly, *Equity* is split into *Equity attributable to shareholders, Equity attributable to non-controlling interests and Equity attributable to preferred noteholders.*

Non-controlling interests subject to option arrangements, e.g., written puts, are generally deemed to be acquired by UBS AG. As a result, the amounts allocated to non-controlling interests are reduced accordingly and a liability equivalent to each option's exercise price is recognized, with any difference between these two amounts recorded in *Share premium.*

15) Leasing

Policy applicable from 1 January 2019[1]

UBS AG predominantly enters into lease contracts, or contracts that include lease components, as a lessee of real estate, including offices, retail branches and sales offices, with a small number of IT hardware leases. UBS AG identifies non-lease components of a contract and accounts for them separately from lease components.

When UBS AG is a lessee in a lease arrangement, UBS AG recognizes a lease liability and corresponding right-of-use (RoU) asset at the commencement of the lease term when UBS AG acquires control of the physical use of the asset. Lease liabilities are presented within *Other financial liabilities measured at amortized cost* and RoU assets within *Property, equipment and software*. The lease liability is measured based on the present value of the lease payments over the lease term, discounted using UBS AG's unsecured borrowing rate, given that the rate implicit in a lease is generally not observable to the lessee. Interest expense on the lease liability is presented within *Interest expense from financial instruments measured at amortized cost*. The RoU asset is recorded at an amount equal to the lease liability but is adjusted for rent prepayments, initial direct costs, any costs to refurbish the leased asset and/or lease incentives received. The RoU asset is depreciated over the shorter of the lease term or the useful life of the underlying asset, with the depreciation presented within *Depreciation and impairment of property, equipment and software*.

Lease payments generally include fixed payments and variable payments that depend on an index (such as an inflation index). When a lease contains an extension or termination option that UBS AG considers reasonably certain to be exercised, the expected rental payments or costs of termination are included within the lease payments used to generate the lease liability. UBS AG does not typically enter into leases with purchase options or residual value guarantees.

Where UBS AG acts as a lessor or sub-lessor under a finance lease, a receivable is recognized in *Other financial assets measured at amortized cost* at an amount equal to the present value of the aggregate of the lease payments plus any unguaranteed residual value that UBS AG expects to recover at the end of the lease term. Initial direct costs are also included in the initial measurement of the lease receivable. Lease payments received during the lease term are allocated as repayments of the outstanding receivable. Interest income reflects a constant periodic rate of return on UBS AG's net investment using the interest rate implicit in the lease (or, for sub-leases, the rate for the head lease). UBS AG reviews the estimated unguaranteed residual value annually, and if the estimated residual value to be realized is less than the amount assumed at lease inception, a loss is recognized for the expected shortfall. Where UBS AG acts as a lessor or sub-lessor in an operating lease, UBS AG recognizes the operating lease income on a straight-line basis over the lease term.

Lease receivables are subject to impairment requirements as set out in item 3g of this Note. Expected credit losses (ECL) on lease receivables are determined following the general impairment model within IFRS 9, *Financial Instruments*, without utilizing the simplified approach of always measuring impairment at the amount of lifetime ECL.

Comparative policy | *Policy applicable prior to 1 January 2019*

Leases that transfer substantially all the risks and rewards, but not necessarily legal title in the underlying assets, are classified as finance leases. All other leases are classified as operating leases. Lease contracts classified as operating leases where UBS AG is the lessee include non-cancelable long-term leases of office buildings in most UBS AG locations. Operating lease rentals payable are recognized as an expense on a straight-line basis over the lease term, which commences with control of the physical use of the property. Lease incentives are treated as a reduction of rental expense and are recognized on a consistent basis over the lease term.

→ **Refer to Note 15 and 33 for more information**

[1] The accounting policy in this section applies from 1 January 2019, the effective date of IFRS 16.

Note 1 Summary of significant accounting policies (continued)

b) Changes in accounting policies, comparability and other adjustments

New or amended accounting standards

Amendments to IAS 39, IFRS 9 and IFRS 7 (Interest Rate Benchmark Reform)

In September 2019, the IASB issued *Interest Rate Benchmark Reform – Amendments to IFRS 9, IAS 39 and IFRS 7*, enabling hedge accounting to continue during the period of uncertainty before existing interest rate benchmarks are replaced with alternative risk-free interest rates. The amendments are mandatorily effective from 1 January 2020, with early adoption permitted, and apply to hedge relationships that exist at the beginning of the reporting period or are designated thereafter, and to the gains or losses that exist in OCI on adoption. As permitted by the transitional provisions, UBS AG early adopted the revisions in 2019. Adopting these amendments allows UBS AG to maintain its existing hedge accounting relationships and to assume that the current benchmark rates will continue to exist, such that the hedge relationships are considered highly effective on a retrospective and prospective basis, with no consequential impact on the financial statements. Further, the amendments bring in additional disclosure requirements on the effects arising from the change in interest rate benchmarks, which are presented in Note 28.

IFRS 16, Leases

Effective from 1 January 2019, UBS AG adopted IFRS 16, *Leases*, which replaced IAS 17, *Leases*, and sets out the principles for the recognition, measurement, presentation and disclosure of leases.

IFRS 16 introduces a single lessee accounting model and fundamentally changes how UBS AG accounts for operating leases when acting as a lessee, with a requirement to record a right-of-use (RoU) asset and lease liability on the balance sheet. UBS AG is a lessee in a number of leases, primarily of real estate, including offices, retail branches and sales offices, with a smaller number of IT hardware leases. As permitted by the transitional provisions of IFRS 16, UBS AG elected to apply the modified retrospective approach and has not restated comparative figures. Overall, adoption of IFRS 16 resulted in a USD 3.4 billion increase in both total assets and total liabilities in UBS AG's consolidated financial statements.

The newly recognized right-of-use assets and finance lease receivables were fully allocated to the business divisions. There was no effect on equity.

→ **Refer to the tables below and on the following page, and Note 2 for more information**

UBS AG applied the following practical expedients that are permitted on transition to IFRS 16 where UBS AG is a lessee in a lease previously classified as an operating lease:
- to not reassess whether or not a contract contained a lease;
- to rely on previous assessments of whether such contracts were considered onerous;
- to rely on previous sale-and-leaseback assessments;
- to adjust lease terms with the benefit of hindsight with respect to whether extension or termination options are reasonably certain of being exercised;
- to discount lease liabilities using the UBS AG's incremental borrowing rate in each currency as of 1 January 2019;
- to initially measure the RoU asset at an amount equal to the lease liability for leases previously classified as operating leases, adjusted for existing lease balances, such as rent prepayments, rent accruals, lease incentives and onerous lease provisions, but excluding initial direct costs; and
- to not apply IFRS 16 to leases the remaining term of which will end within 12 months from the transition date.

The measurement of leases previously classified as finance leases where UBS AG acts as a lessee has not changed on transition to IFRS 16. Similarly, UBS AG has made no adjustments where UBS AG acts as a lessor, in either a finance or operating lease, of physical assets it owns. Where UBS AG acts as an intermediate lessor, i.e., where UBS AG enters into a head lease and sub-leases the asset to a third party, the sub-lease has been classified as either a finance or operating lease based primarily on whether the sub-lease term consumes the majority of the remaining useful life of the RoU asset arising from the head lease as of the transition date.

The following table reconciles the obligations in respect of operating leases as of 31 December 2018 to the opening lease liabilities recognized on 1 January 2019.

Reconciliation between operating lease commitments disclosed under IAS 17 and lease liabilities recognized under IFRS 16

USD million	
Total undiscounted operating lease commitments as of 31 December 2018	4,546
Leases with a remaining term of less than one year as of 1 January 2019	(18)
Excluded service components	(296)
Reassessment of lease term for extension or termination options	424
Total undiscounted lease payments	4,657
Discounted at a weighted average incremental borrowing rate of 3.07%	(720)
IFRS 16 transition adjustment	3,937
Finance lease liabilities as of 31 December 2018	19
Carrying amount of total lease liabilities as of 1 January 2019	3,956

Note 1 Summary of significant accounting policies (continued)

The following table provides details about the determination of RoU assets on transition.

Determination of RoU assets on transition

USD million	Carrying amount
Recognition of gross RoU assets upon adoption of IFRS 16 (IFRS 16 transition adjustment)	3,937
Offset by liabilities recognized as of 31 December 2018	(515)
of which: other non-financial liabilities (lease incentives)	*(204)*
of which: other financial liabilities measured at amortized cost (rent accruals)	*(180)*
of which: provisions (onerous lease provisions)	*(131)*
Increase in total assets resulting from the adoption of IFRS 16 on 1 January 2019[1]	3,422
Reclassification of assets recognized as of 31 December 2018 as an addition to RoU assets	38
of which: other financial assets measured at amortized cost (finance lease assets recognized under IAS 17 as of 31 December 2018)	*19*
of which: other non-financial assets (prepaid rent)	*19*
Reclassification of finance lease receivables from sub-leases to other financial assets measured at amortized cost resulting in a reduction of RoU assets	(176)
Total RoU assets as of 1 January 2019 presented within Property, equipment and software	3,284

1 Total liabilities increased by the same amount upon adoption of IFRS 16.

Lease liabilities are presented within *Other financial liabilities measured at amortized cost* and RoU assets within *Property, equipment and software*. Finance lease receivables are included within *Other financial assets measured at amortized cost*. Due to the practical expedients taken on transition, there was no effect on equity. The weighted average lease term on 1 January 2019 was approximately nine years.

The 2019 depreciation expense for RoU assets, which is presented within *Depreciation and impairment of property, equipment and software*, was USD 463 million. The 2019 interest expense on lease liabilities, which is presented within *Interest expense from financial instruments measured at amortized cost*, was USD 118 million. Occupancy expenses, which are presented within *General and administrative expenses*, decreased by USD 510 million between 2018 and 2019, which primarily reflected the adoption of IFRS 16. The full year effect of the application of IFRS 16 was a net decrease in profit before tax of approximately USD 60 million.

IFRIC 23, Uncertainty over Income Tax Treatments

Effective from 1 January 2019, UBS AG adopted IFRIC Interpretation 23, *Uncertainty over Income Tax Treatments* (IFRIC 23), which addresses how uncertain tax positions should be accounted for under IFRS. IFRIC 23 requires that, where acceptance of the tax treatment by the relevant tax authority is considered probable, it should be assumed as an accounting recognition matter that treatment of the item will ultimately be accepted. Therefore no tax provision would be required in such cases. However, if acceptance of the tax treatment is not considered probable, the entity is required to reflect that uncertainty using an expected value (i.e., a probability-weighted approach) or the single most likely amount.

Upon adoption of IFRIC 23 on 1 January 2019, UBS AG recognized a net tax expense of USD 11 million in retained earnings.

Amendments to IAS 19, Employee Benefits

Effective from 1 January 2019, UBS AG adopted amendments to IAS 19, *Employee Benefits*, which address the accounting when a plan amendment, curtailment or settlement occurs during the reporting period. The amendments require entities to use the updated actuarial assumption to determine current service cost and net interest for the remainder of the annual reporting period after such an event. The amendments also clarify how the accounting requirements for a plan amendment, curtailment or settlement affect the asset ceiling requirements. The amendments are effective prospectively for plan amendments, curtailments or settlements that occur on or after 1 January 2019. Adoption on 1 January 2019 had no effect on UBS AG's financial statements.

Annual Improvements to IFRS Standards 2015–2017 Cycle

Effective from 1 January 2019, UBS AG adopted Annual Improvements to IFRS Standards 2015–2017 Cycle, which resulted in amendments to IFRS 3, *Business Combinations*, IFRS 11, *Joint Arrangements*, IAS 12, *Income Taxes*, and IAS 23, *Borrowing Costs*. Adoption of these amendments on 1 January 2019 had no material effect on UBS AG's financial statements.

Note 1 Summary of significant accounting policies (continued)

Other changes to presentation or segment reporting

Presentation of dividend income and expense from financial instruments measured at fair value through profit or loss

Effective from 1 January 2019, UBS AG refined the presentation of dividend income and expense. This resulted in a reclassification of dividends from *Interest income (expense) from financial instruments measured at fair value through profit or loss* into *Other net income from financial instruments measured at fair value through profit or loss* (prior to 1 January 2019: *Other net income from fair value changes on financial instruments*). The change aligns the presentation of dividends with related fair value changes from equity instruments and economic hedges, removing volatility that has historically arisen within both *Net interest income* and *Other net income from financial instruments measured at fair value through profit or loss*. There is no effect on *Total operating income* or *Net profit / (loss)*. Prior periods have been restated for this presentational change and the effect on the respective reporting lines is outlined in the table below.

Changes to the presentation of dividend income and expense from financial instruments measured at fair value through profit or loss

	For the year ended	
USD million	31.12.18	31.12.17
Interest income from financial instruments measured at fair value through profit or loss	(2,308)	(1,762)
Interest expense from financial instruments measured at fair value through profit or loss	1,331	1,190
Net interest income	**(976)**	**(572)**
Other net income from financial instruments measured at fair value through profit or loss	**976**	**572**

Changes to Corporate Center

As of 1 January 2019, UBS AG has operationally combined Group Treasury activities with Group ALM and calls this combined unit Group Treasury.

In order to further align Group and divisional performance, UBS AG adjusted the methodology for the allocation of Group Treasury and Corporate Center – Services funding costs and expenses to the business divisions. At the same time, UBS AG updated its funds transfer pricing framework to better reflect the sources and usage of funding. All of these changes became effective as of 1 January 2019 and prior-period segment information has been restated. Together, these changes decreased the operating results of the business divisions and thereby increased their adjusted cost / income ratios 1–2 percentage points, with an offsetting effect of USD 0.7 billion in Corporate Center's operating profit / (loss) before tax. Corporate Center has retained funding costs for deferred tax assets, costs relating to UBS AG's legal entity transformation program and other costs not attributable to, or representative of the performance of, the business divisions.

Alongside the update to allocations and UBS AG's funds transfer pricing framework, UBS AG has increased the allocation of balance sheet resources from Corporate Center to the business divisions, resulting in USD 223 billion of assets allocated from Corporate Center to the business divisions in restated 2018 numbers, predominantly from high-quality liquid assets and certain other assets centrally managed on behalf of the business divisions.

Further, due to the aforementioned changes to UBS's methodology for allocating funding costs and expenses and a substantial reduction in the size and resource consumption of the various Corporate Center units, UBS AG provides results for total Corporate Center only and does not separately report Corporate Center – Services, Group Treasury and Non-core and Legacy Portfolio, in compliance with IFRS 8, *Operating Segments*. Prior-period information has been restated.

→ **Refer to Note 2 for more information**

c) International Financial Reporting Standards and Interpretations to be adopted in 2020 and later and other changes

Adoption of hedge accounting requirements of IFRS 9, *Financial Instruments*

Effective 1 January 2020, UBS AG will adopt the hedge accounting requirements of IFRS 9, *Financial Instruments* for most of its existing hedge accounting programs, including fair value hedges of interest rate risk related to debt instruments, cash flow hedges of forecast transactions and hedges of net investments in foreign operations. As permitted by IFRS 9, UBS AG will continue to account for its fair value hedges of portfolio interest rate risk related to loans under IAS 39, *Financial Instruments: Recognition and Measurement*.

IFRS 9's hedge accounting model further aligns accounting with risk management practices, amends hedge effectiveness requirements and prohibits voluntary de-designations. IFRS 9 permits certain additional hedged items, including layer components, net positions, or aggregated exposures, such as a combination of a non-derivative and derivative, to be designated. IFRS 9 also introduces the concept of "cost of hedging," under which the time value of options, the forward element of a forward contract or foreign currency basis spreads in a cross-currency swap can be deferred in other comprehensive income and, depending on the nature of the hedged transaction, released to the income statement either when the hedged item impacts the income statement or over the term of the hedged item.

The adoption of these requirements will have no consequential financial impact on UBS AG's financial statements. However, the adoption will allow UBS AG to designate more effective hedge accounting relationships going forward, including fair value hedges of foreign currency risk using cross-currency swaps, and reduce income statement volatility caused by foreign currency basis spreads.

Conceptual Framework

In March 2018, the IASB issued a revised version of its Conceptual Framework for Financial Reporting (the Framework). The Framework sets out the fundamental concepts of financial reporting and will be used by the IASB in developing IFRS standards. Preparers use the Framework as a point of reference to develop accounting policies in rare instances where a particular business transaction is not covered by existing IFRS standards.

The adoption of the Framework by UBS AG on 1 January 2020 will have no effect on its financial statements.

Amendments to IFRS 3, *Business Combinations*

In October 2018, the IASB issued *Definition of a Business (Amendments to IFRS 3)*. The amendments clarify the definition of a business, with the objective of assisting in the determination of whether a transaction should be accounted for as a business combination or an asset acquisition. The amendments apply to transactions with an acquisition date on or after 1 January 2020. The adoption of these amendments on 1 January 2020 will have no effect on its financial statements.

IFRS 17, *Insurance Contracts*

In May 2017, the IASB issued IFRS 17, *Insurance Contracts*, which sets out the accounting requirements for contractual rights and obligations that arise from insurance contracts issued and reinsurance contracts held. IFRS 17 is effective from 1 January 2021; however, as part of the targeted amendments to IFRS 17, the IASB is considering delaying the mandatory implementation date by one year. UBS AG is assessing the standard, but does not expect it to have a material effect on its financial statements.

Note 2a Segment reporting

The operational structure of UBS AG as of 31 December 2019 was comprised of Corporate Center and four business divisions: Global Wealth Management, Personal & Corporate Banking, Asset Management and the Investment Bank.

→ **Refer to "Segment reporting" in Note 1a for more information**

Global Wealth Management

Global Wealth Management provides investment advice and solutions to private clients, in particular in the ultra high net worth and high net worth segments. Clients benefit from Global Wealth Management's comprehensive set of capabilities, including wealth planning, investing, lending, asset protection, philanthropy, corporate and banking services, as well as family office services in collaboration with the Investment Bank and Asset Management. Global Wealth Management has a global footprint, with the US representing its largest market. Clients are served through local offices and dedicated advisors. The ultra high net worth business is managed globally across the regions.

Personal & Corporate Banking

Personal & Corporate Banking provides comprehensive financial products and services to private, corporate and institutional clients and operates in Switzerland in the private and corporate loan market. Personal & Corporate Banking is central to UBS's universal bank model in Switzerland and it works with Global Wealth Management, the Investment Bank and Asset Management to help clients receive the best products and solutions for their specific financial needs. While Personal & Corporate Banking operates primarily in its home market of Switzerland, it also provides capabilities to support the growth of the international business activities of UBS AG's corporate and institutional clients through local hubs in Frankfurt, New York, Hong Kong and Singapore. The business is divided into Personal Banking and Corporate & Institutional Clients (CIC).

Asset Management

Asset Management is a large-scale and diversified global asset manager. It offers investment capabilities and styles across all major traditional and alternative asset classes, as well as advisory support to institutions, wholesale intermediaries and Global Wealth Management clients around the world. Asset Management offers clients a wide range of investment products and services in different asset classes in the form of segregated, pooled or advisory mandates, as well as registered investment funds in various jurisdictions. It covers the main asset management markets globally, and has a local presence in 22 markets, grouped in four regions: the Americas; Europe, Middle East and Africa; Switzerland; and Asia Pacific.

Investment Bank

The Investment Bank provides a range of services to institutional, corporate and wealth management clients to help them raise capital, grow their businesses, invest and manage risks. It is focused on its traditional strengths in advisory services, capital markets, equities and foreign exchange, complemented by a targeted rates and credit platform. The Investment Bank uses its research and technology capabilities to support its clients as they adapt to the evolving market structures and changes in the regulatory, technological, economic and competitive landscapes. The Investment Bank delivers solutions to clients, using its intellectual capital and electronic platforms. It also provides services to Global Wealth Management, Personal & Corporate Banking and Asset Management. It has a global reach, with a presence in more than 30 countries and principal offices in the major financial hubs.

Corporate Center

Corporate Center consists of the Group Chief Operating Officer area (Group Technology, Group Corporate Services, Group Human Resources and Group Operations), Group Treasury, Group Finance, Group Legal, Group Risk Control, Group Communications & Branding, Group Compliance, Regulatory & Governance, UBS in society, and Non-core and Legacy Portfolio (NCL). Over recent years, UBS has progressively aligned its support functions with the business divisions. The majority of these functions are either fully aligned or shared among business divisions, where they have full management responsibility.

Group Treasury manages the structural risk of UBS AG's balance sheet, including interest rate risk, structural foreign exchange risk and collateral risk, as well as the risks associated with UBS AG's liquidity and funding portfolios. Group Treasury serves all business divisions through two main risk management areas, and its risk management is fully integrated into UBS AG's risk governance framework.

NCL manages legacy positions from businesses exited by the Investment Bank. It is overseen by a committee chaired by the Group Chief Risk Officer. The portfolio also includes positions relating to legal matters arising from businesses that were transferred to it at the time of its formation.

Beginning with the first quarter 2019 and in compliance with IFRS 8, *Operating Segments*, UBS AG provides results for total Corporate Center only and does not separately report Corporate Center – Services, Group Treasury and NCL.

Note 2a Segment reporting (continued)

Changes in Corporate Center cost and resource allocation to business divisions

In order to further align Group and divisional performance, UBS AG has adjusted its methodology for the allocation of Corporate Center funding costs and expenses to the business divisions. At the same time, it has updated its funds transfer pricing framework to better reflect the sources and usage of funding. Additionally, UBS AG has increased the allocation of balance sheet resources from Corporate Center to the business divisions. Prior periods have been restated and the effect on the respective reporting lines is outlined in the table below.

These changes had no effect on the reported results or financial position of UBS AG.

Upon adoption of IFRS 16, *Leases*, on 1 January 2019, UBS AG additionally allocated approximately USD 3.4 billion of newly recognized right-of-use assets and finance lease receivables to the business divisions.

→ **Refer to Note 1b for more information**

Effects of changes in Corporate Center cost and resource allocation to business divisions on prior-period information

USD million increase / (reduction)	Global Wealth Management	Personal & Corporate Banking	Asset Management	Investment Bank	Corporate Center	UBS AG
For the year ended 31 December 2018						
Operating profit / (loss) before tax	(374)	(116)	(25)	(163)	677	0
Total assets	113,702	61,894	3,769	43,562	(222,927)	0
For the year ended 31 December 2017						
Operating profit / (loss) before tax	(351)	(133)	(24)	(180)	689	0
Total assets	102,641	58,196	3,329	41,628	(205,795)	0

Segment reporting

USD million	Global Wealth Management	Personal & Corporate Banking	Asset Management	Investment Bank	Corporate Center	UBS AG
For the year ended 31 December 2019[1]						
Net interest income[2]	3,947	1,993	(25)	(669)	(831)	4,415
Non-interest income[2]	12,426	1,745	1,962	7,967	869	24,970
Income	16,373	3,737	1,938	7,298	38	29,385
Credit loss (expense) / recovery	(20)	(21)	0	(30)	(7)	(78)
Total operating income	16,353	3,717	1,938	7,268	31	29,307
Personnel expenses	7,618	852	720	2,732	1,879	13,801
General and administrative expenses	1,283	229	201	738	6,135	8,586
Services (to) / from Corporate Center and other business divisions	4,055	1,179	485	2,922	(8,642)	0
of which: services from Corporate Center	*3,922*	*1,293*	*530*	*2,976*	*(8,721)*	*0*
Depreciation and impairment of property, equipment and software	5	13	1	8	1,549	1,576
Amortization and impairment of goodwill and intangible assets[3]	56	0	0	115	4	175
Total operating expenses	13,018	2,274	1,407	6,515	925	24,138
Operating profit / (loss) before tax	**3,335**	**1,443**	**531**	**753**	**(893)**	**5,169**
Tax expense / (benefit)						1,198
Net profit / (loss)						**3,971**
Additional information						
Total assets	309,766	209,512	34,565	316,058	102,017	971,916
Additions to non-current assets[4]	68	10	0	1	4,935	5,014

1 Comparative figures in this table have been restated for the changes in Corporate Center cost and resource allocation to the business divisions and the changes in the equity attribution framework. Refer to further discussion in this note and in Note 1b. 2 Effective 1 January 2019, UBS refined the presentation of dividend income and expense, reclassifying dividends from financial instruments measured at fair value through profit or loss from Net interest income to Non-interest income. Prior-period information was restated accordingly, with virtually all of the effect on UBS AG arising from the Investment Bank. Refer to Note 1b for more information. 3 Refer to Note 16 for more information. 4 Upon adoption of IFRS 16 on 1 January 2019, UBS AG additionally allocated approximately USD 3.4 billion of newly recognized assets to the business divisions, of which USD 3.3 billion related to non-current assets. Refer to Note 1b for more information.

Note 2a Segment reporting (continued)

USD million	Global Wealth Management	Personal & Corporate Banking	Asset Management	Investment Bank	Corporate Center	UBS AG
For the year ended 31 December 2018[1]						
Net interest income[2]	4,101	2,049	(29)	(459)	(690)	4,971
Non-interest income[2]	12,700	2,169	1,881	8,539	499	25,788
Income	16,801	4,218	1,852	8,080	(191)	30,759
Credit loss (expense) / recovery	(15)	(56)	0	(38)	(8)	(117)
Total operating income	16,786	4,162	1,852	8,042	(199)	30,642
Personnel expenses	7,680	799	702	2,936	1,875	13,992
General and administrative expenses	1,771	289	206	706	7,104	10,075
Services (to) / from Corporate Center and other business divisions	4,069	1,261	516	2,938	(8,784)	0
of which: services from Corporate Center	*3,935*	*1,365*	*561*	*2,991*	*(8,852)*	*0*
Depreciation and impairment of property, equipment and software	4	14	2	8	1,023	1,052
Amortization and impairment of goodwill and intangible assets[3]	50	0	1	12	2	65
Total operating expenses	13,574	2,363	1,427	6,600	1,220	25,184
Operating profit / (loss) before tax	**3,212**	**1,799**	**425**	**1,442**	**(1,419)**	**5,458**
Tax expense / (benefit)						1,345
Net profit / (loss)						**4,113**
Additional information						
Total assets	313,737	200,767	28,140	302,434	112,977	958,055
Additions to non-current assets	196	23	1	89	1,449	1,757

1 Comparative figures in this table have been restated for the changes in Corporate Center cost and resource allocation to the business divisions and the changes in the equity attribution framework. Refer to further discussion in this note and in Note 1b. 2 Effective 1 January 2019, UBS refined the presentation of dividend income and expense, reclassifying dividends from financial instruments measured at fair value through profit or loss from Net interest income to Non-interest income. Prior-period information was restated accordingly, with virtually all of the effect on UBS AG arising from the Investment Bank. Refer to Note 1b for more information. 3 Refer to Note 16 for more information.

Note 2a Segment reporting (continued)

USD million	Global Wealth Management	Personal & Corporate Banking	Asset Management	Investment Bank	Corporate Center	UBS AG
For the year ended 31 December 2017[1]						
Net interest income[2]	3,880	2,044	(23)	234	(114)	6,021
Non-interest income[2]	12,265	1,815	2,100	7,508	466	24,155
Income[3]	16,145	3,859	2,077	7,742	352	30,176
Credit loss (expense) / recovery	(8)	(20)	0	(92)	(11)	(131)
Total operating income	16,137	3,839	2,077	7,651	341	30,044
Personnel expenses	7,679	849	731	3,007	2,686	14,952
General and administrative expenses	1,308	300	238	728	6,426	9,001
Services (to) / from Corporate Center and other business divisions	3,926	1,200	541	2,858	(8,525)	0
of which: services from Corporate Center	*3,803*	*1,318*	*580*	*2,892*	*(8,593)*	*0*
Depreciation and impairment of property, equipment and software	4	13	1	10	916	945
Amortization and impairment of goodwill and intangible assets[4]	49	0	3	12	7	71
Total operating expenses	12,966	2,363	1,515	6,614	1,510	24,969
Operating profit / (loss) before tax	**3,171**	**1,476**	**562**	**1,036**	**(1,169)**	**5,076**
Tax expense / (benefit)						4,242
Net profit / (loss)						**834**
Additional information						
Total assets	297,631	197,290	17,968	311,477	115,654	940,020
Additions to non-current assets	120	15	1	3	1,509	1,648

1 Comparative figures in this table have been restated for the changes in Corporate Center cost and resource allocation to the business divisions and the changes in the equity attribution framework. Refer to further discussion in this note and in Note 1b. 2 Effective 1 January 2019, UBS refined the presentation of dividend income and expense, reclassifying dividends from financial instruments measured at fair value through profit or loss from Net interest income to Non-interest income. Prior-period information was restated accordingly, with virtually all of the effect on UBS AG arising from the Investment Bank. Refer to Note 1b for more information. 3 Includes impairments of financial assets classified at fair value through other comprehensive income (prior to 2018 classified as financial assets available for sale) for the year ended 31 December 2017 of USD 15 million, of which USD 12 million was recorded in Asset Management. 4 Refer to Note 16 for more information.

Note 2b Segment reporting by geographic location

The operating regions shown in the table below correspond to the regional management structure of UBS AG. The allocation of operating income to these regions reflects, and is consistent with, the basis on which the business is managed and its performance is evaluated. These allocations involve assumptions and judgments that management considers to be reasonable, and may be refined to reflect changes in estimates or management structure. The main principles of the allocation methodology are that client revenues are attributed to the domicile of the client and trading and portfolio management revenues are attributed to the country where the risk is managed. This revenue attribution is consistent with the mandate of the regional Presidents. Certain revenues, such as those related to Non-core and Legacy Portfolio in Corporate Center, are managed at a Group level. These revenues are included in the *Global* line.

The geographic analysis of non-current assets is based on the location of the entity in which the assets are recorded.

For the year ended 31 December 2019

	Total operating income		Total non-current assets	
	USD billion	Share %	USD billion	Share %
Americas	12.0	41	8.9	46
of which: USA	*10.9*	*37*	*8.5*	*44*
Asia Pacific	4.7	16	1.3	7
Europe, Middle East and Africa (excluding Switzerland)	5.8	20	2.6	13
Switzerland	6.7	23	6.5	34
Global	0.0	0	0.0	0
Total	29.3	100	19.3	100

For the year ended 31 December 2018[1]

	Total operating income		Total non-current assets	
	USD billion	Share %	USD billion	Share %
Americas	12.6	41	7.4	46
of which: USA	*11.5*	*37*	*7.0*	*43*
Asia Pacific	4.9	16	0.8	5
Europe, Middle East and Africa (excluding Switzerland)	6.2	20	1.8	11
Switzerland	7.2	23	6.2	38
Global	(0.3)	(1)	0.0	0
Total	**30.6**	**100**	**16.2**	**100**

For the year ended 31 December 2017[1]

	Total operating income		Total non-current assets	
	USD billion	Share %	USD billion	Share %
Americas	12.0	40	7.4	47
of which: USA	*11.2*	*37*	*6.9*	*44*
Asia Pacific	4.8	16	0.8	5
Europe, Middle East and Africa (excluding Switzerland)	6.1	20	1.7	10
Switzerland	6.9	23	6.0	38
Global	0.2	1	0.0	0
Total	**30.0**	**100**	**15.8**	**100**

1 Comparative figures in this table have been restated for the changes in Corporate Center cost and resource allocation to the business divisions and the changes in the equity attribution framework. Refer to further discussion in this note and in Note 1b.

Income statement notes

Note 3 Net interest income and other net income from financial instruments measured at fair value through profit or loss

	For the year ended		
USD million	31.12.19	31.12.18	31.12.17
Net interest income from financial instruments measured at amortized cost and fair value through other comprehensive income	3,400	3,628	4,969
Net interest income from financial instruments measured at fair value through profit or loss	1,015	1,344	1,052
Other net income from financial instruments measured at fair value through profit or loss	6,833	6,953	5,640
Total	11,248	11,924	11,661
Global Wealth Management	*4,913*	*5,050*	*4,942*
of which: net interest income	*3,947*	*4,101*	*3,880*
of which: transaction-based income from foreign exchange and other intermediary activity[1]	*966*	*948*	*1,062*
Personal & Corporate Banking	*2,436*	*2,452*	*2,420*
of which: net interest income	*1,993*	*2,049*	*2,044*
of which: transaction-based income from foreign exchange and other intermediary activity[1]	*443*	*402*	*376*
Asset Management	*(13)*	*(35)*	*(34)*
Investment Bank	*4,187*	*4,757*	*4,273*
Corporate Client Solutions	*716*	*1,051*	*1,076*
Investor Client Services	*3,471*	*3,705*	*3,197*
Corporate Center	*(276)*	*(299)*	*60*
Net interest income[2,3]			
Net interest income from financial instruments measured at amortized cost and fair value through other comprehensive income			
Interest income from loans and deposits[4]	8,026	7,822	7,766
Interest income from securities financing transactions[5]	2,005	1,567	1,573
Interest income from other financial instruments measured at amortized cost	364	266	99
Interest income from debt instruments measured at fair value through other comprehensive income	120	142	152
Interest income from derivative instruments designated as cash flow hedges	188	324	846
Total interest income from financial instruments measured at amortized cost and fair value through other comprehensive income	10,703	10,121	10,437
Interest expense on loans and deposits[6]	4,541	3,566	2,515
Interest expense on securities financing transactions[7]	1,152	1,130	1,473
Interest expense on debt issued	1,491	1,797	1,480
Interest expense on lease liabilities[8]	118		
Total interest expense from financial instruments measured at amortized cost	7,303	6,494	5,468
Total net interest income from financial instruments measured at amortized cost and fair value through other comprehensive income	3,400	3,628	4,969
Net interest income from financial instruments measured at fair value through profit or loss			
Net interest income from financial instruments at fair value held for trading	1,218	1,111	1,374
Net interest income from brokerage balances	339	575	
Interest income from financial instruments at fair value not held for trading	2,274	1,757	
Other interest income	185	215	0
Interest expense on financial instruments designated at fair value	(3,000)	(2,314)	(322)
Total net interest income from financial instruments measured at fair value through profit or loss	1,015	1,344	1,052
Total net interest income	4,415	4,971	6,021
Other net income from financial instruments measured at fair value through profit or loss			
Investment Bank Corporate Client Solutions	229	552	633
Investment Bank Investor Client Services	4,628	4,663	3,406
Other business divisions and Corporate Center	1,976	1,737	1,601
Other net income from financial instruments measured at fair value through profit or loss	6,833	6,953	5,640
of which: net gains / (losses) from financial liabilities designated at fair value[9]	*(8,748)*	*9,382*	*(3,979)*

1 Mainly includes spread-related income in connection with client-driven transactions, foreign currency translation effects and income and expenses from precious metals, which are included in the income statement line Other net income from financial instruments measured at fair value through profit or loss. 2 Effective 1 January 2018, UBS AG adopted IFRS 9, Financial Instruments, which resulted in a prospective change in the classification of certain financial instruments. Refer to "Note 1c Changes in accounting policies and comparability and transition effects from the adoption of IFRS 9 Financial Instruments" in the "Consolidated financial statements" section of the Annual Report 2018 for more information. 3 Effective 1 January 2019, UBS AG refined the presentation of dividend income and expense, reclassifying dividends from Interest income (expense) from financial instruments measured at fair value through profit or loss to Other net income from financial instruments measured at fair value through profit or loss. Prior-year comparative information was restated accordingly. Refer to Note 1b for more information. 4 Consists of interest income from cash and balances at central banks, loans and advances to banks and customers, cash collateral receivables on derivative instruments, and negative interest on amounts due to banks and customer deposits. 5 Includes interest income on receivables from securities financing transactions and negative interest, including fees, on payables from securities financing transactions. 6 Consists of interest expense on amounts due to banks, cash collateral payables on derivative instruments, customer deposits, funding from UBS Group AG and its subsidiaries, and negative interest on cash and balances at central banks, loans and advances to banks. 7 Includes interest expense on payables from securities financing transactions and negative interest, including fees, on receivables from securities financing transactions. 8 Relates to lease liabilities recognized upon adoption of IFRS 16 on 1 January 2019. Refer to Note 1b for more information. 9 Excludes fair value changes of hedges related to financial liabilities designated at fair value and foreign currency translation effects arising from translating foreign currency transactions into the respective functional currency, both of which are reported within Other net income from financial instruments measured at fair value through profit or loss. 2019 included a net loss of USD 1,830 million (2018: net gain of USD 2,152 million) related to financial liabilities related to unit-linked investment contracts, which are designated at fair value through profit or loss. This was offset by a net gain of USD 1,830 million (2018: net loss of USD 2,134 million) related to financial assets for unit-linked investment contracts that are mandatorily measured at fair value through profit or loss not held for trading.

Note 4 Net fee and commission income[1]

	For the year ended		
USD million	31.12.19	31.12.18	31.12.17
Fee and commission income			
Underwriting fees	784	843	1,029
of which: equity underwriting fees	*360*	*431*	*573*
of which: debt underwriting fees	*424*	*412*	*456*
M&A and corporate finance fees	774	768	698
Brokerage fees	3,248	3,521	3,821
Investment fund fees	4,859	4,955	4,322
Portfolio management and related services	7,656	7,756	7,666
Other	1,836	1,789	1,854
Total fee and commission income[1]	19,156	19,632	19,390
of which: recurring	*12,545*	*12,911*	
of which: transaction-based	*6,449*	*6,629*	
of which: performance-based	*163*	*93*	
Fee and commission expense			
Brokerage fees paid	310	316	673
Distribution fees paid	590	580	514
Other	796	807	653
Total fee and commission expense	1,696	1,703	1,840
Net fee and commission income	17,460	17,930	17,550
of which: net brokerage fees	*2,938*	*3,205*	*3,148*

1 For the year ended 31 December 2019, reflects third-party fee and commission income of USD 11,694 million for Global Wealth Management, USD 3,397 million for the Investment Bank, USD 2,659 million for Asset Management, USD 1,307 million for Personal & Corporate Banking and USD 98 million for Corporate Center (for the year ended 31 December 2018: USD 12,059 million for Global Wealth Management, USD 3,557 million for the Investment Bank, USD 2,579 million for Asset Management, USD 1,338 million for Personal & Corporate Banking and USD 100 million for Corporate Center).

Note 5 Other income

	For the year ended		
USD million	31.12.19	31.12.18	31.12.17
Associates, joint ventures and subsidiaries			
Net gains / (losses) from acquisitions and disposals of subsidiaries[1]	(36)	(292)[2,3]	32
Net gains / (losses) from disposals of investments in associates	4	46[4]	0
Share of net profits of associates and joint ventures	46	529[5]	76
Impairments related to associates	(1)	0	(7)
Total	13	283	101
Net gains / (losses) from disposals of financial assets measured at fair value through other comprehensive income	31	0	195
Impairment of financial assets measured at fair value through other comprehensive income	0	0	(15)
Net gains / (losses) from disposals of financial assets measured at amortized cost	0	0	14
Income from properties[6]	27	24	24
Net gains / (losses) from properties held for sale	(19)	40	0
Income from shared services provided to UBS Group AG or its subsidiaries	464	478	395
Other	161	80	251
Total other income	677	905	965

1 Includes foreign exchange gains / (losses) reclassified from other comprehensive income related to the disposal or closure of foreign operations. 2 Includes a remeasurement loss of USD 270 million related to UBS Securities China. Refer to Note 32 for more information. 3 Includes a USD 25 million gain on sale of subsidiaries and a USD 31 million pre-tax gain on sale of real estate related to the Widder Hotel. Refer to Note 32 for more information. 4 Reflects a net foreign currency translation gain related to UBS Securities China. Refer to Note 32 for more information. 5 Includes a USD 460 million valuation gain on our equity ownership in SIX related to the sale of SIX Payment Services to Worldline. 6 Includes rent received from third parties.

Note 6 Personnel expenses

	For the year ended		
USD million	31.12.19	31.12.18	31.12.17
Salaries[1]	5,183	5,199	5,423
Variable compensation – performance awards[2]	2,545	2,794	3,054
of which: guarantees for new hires	*29*	*43*	*36*
Variable compensation – other[2]	225	220	231
of which: replacement payments[3]	*55*	*68*	*70*
of which: forfeiture credits	*(84)*	*(136)*	*(106)*
of which: severance payments[4]	*110*	*106*	*95*
of which: retention plan and other payments	*52*	*64*	*62*
of which: Deferred Contingent Capital Plan – interest expense	*93*	*116*	*110*
Financial advisor compensation[2,5]	4,043	4,054	4,064
Contractors	147	184	318
Social security	627	629	731
Pension and other post-employment benefit plans[6]	569	363	601
Other personnel expenses	461	549	531
Total personnel expenses	13,801	13,992	14,952

1 Includes role-based allowances. 2 Refer to Note 30 for more information. 3 Replacement payments are payments made to compensate employees for deferred awards forfeited as a result of joining UBS. 4 Includes legally obligated and standard severance payments. 5 Financial advisor compensation consists of grid-based compensation based directly on compensable revenues generated by financial advisors and supplemental compensation calculated on the basis of financial advisor productivity, firm tenure, assets and other variables. It also includes expenses related to compensation commitments with financial advisors entered into at the time of recruitment that are subject to vesting requirements. 6 Changes to the pension fund of UBS AG in Switzerland in 2018 resulted in a reduction in the pension obligation recognized by UBS AG. As a consequence, a pre-tax gain of USD 132 million was recognized in the income statement in 2018, with no overall effect on total equity. Refer to Note 29 for more information.

Note 7 General and administrative expenses

	For the year ended		
USD million	31.12.19	31.12.18	31.12.17
Occupancy[1]	342	852	865
Rent and maintenance of IT and other equipment	339	326	422
Communication and market data services	517	520	544
Administration	5,176	5,383	3,644
of which: shared services costs charged by UBS Group AG or its subsidiaries	*4,621*	*4,803*	*3,046*
of which: UK and German bank levies[2]	*41*	*58*	*20*
Marketing and public relations	233	277	338
Travel and entertainment	325	367	382
Professional fees	782	870	1,086
Outsourcing of IT and other services	610	729	1,169
Litigation, regulatory and similar matters[3]	165	657	434
Other	97	95	118
Total general and administrative expenses	8,586	10,075	9,001

1 Occupancy expenses decreased following the application of IFRS 16, which was adopted on 1 January 2019. Refer to Note 1b for more information. 2 The UK bank levy expenses of USD 30 million (USD 40 million for 2018 and USD 17 million for 2017) included a credit of USD 31 million (USD 45 million and USD 85 million, respectively) related to prior years. 3 Reflects the net increase in provisions for litigation, regulatory and similar matters recognized in the income statement. Refer to Note 21 for more information. Also includes recoveries from third parties of USD 11 million, USD 29 million and USD 55 million for the years ended 31 December 2019, 31 December 2018 and 31 December 2017, respectively.

Note 8 Income taxes

USD million	For the year ended 31.12.19	31.12.18	31.12.17
Tax expense / (benefit)			
Swiss			
Current	336	434	408
Deferred	246	2,326	91
Total Swiss	582	**2,760**	**499**
Non-Swiss			
Current	402	537	435
Deferred	214	(1,952)	3,308
Total non-Swiss	616	**(1,415)**	**3,743**
Total income tax expense / (benefit) recognized in the income statement	1,198	**1,345**	**4,242**

Income tax recognized in the income statement

Income tax expenses of USD 1,198 million were recognized for UBS AG in 2019, representing an effective tax rate of 23.2%. This included net Swiss tax expenses of USD 582 million and net non-Swiss tax expenses of USD 616 million.

The Swiss tax expenses included current tax expenses of USD 336 million related to taxable profits earned by Swiss subsidiaries. In addition, they included deferred tax expenses of USD 246 million, which primarily reflect the amortization of deferred tax assets (DTAs) previously recognized in relation to deductible temporary differences.

The non-Swiss tax expenses included current tax expenses of USD 402 million related to taxable profits earned by non-Swiss subsidiaries and branches. In addition, they included deferred tax expenses of USD 214 million. These included expenses of USD 474 million that primarily reflected the amortization of DTAs previously recognized in relation to tax losses carried forward and deductible temporary differences, including the amortization of US tax loss DTAs at the level of UBS Americas Inc. These were partly offset by a benefit of USD 260 million in respect of additional DTA recognition that resulted from the contribution of real estate assets by UBS AG to UBS Americas Inc. in the year. The additional DTA recognition related to the elections that were made in the fourth quarter of 2018 to capitalize certain historic real estate costs.

USD million	For the year ended 31.12.19	31.12.18	31.12.17
Operating profit / (loss) before tax	5,169	5,458	5,076
of which: Swiss	*2,297*	*1,427*	*1,911*
of which: non-Swiss	*2,872*	*4,031*	*3,165*
Income taxes at Swiss tax rate of 20.5% for 2019 and 21% for 2018 and 2017	1,060	1,146	1,066
Increase / (decrease) resulting from:			
Non-Swiss tax rates differing from Swiss tax rate	72	68	230
Tax effects of losses not recognized	131	222	173
Previously unrecognized tax losses now utilized	(265)	(25)	(368)
Non-taxable and lower taxed income	(305)	(419)	(306)
Non-deductible expenses and additional taxable income	713	883	588
Adjustments related to prior years – current tax	1	114	(14)
Adjustments related to prior years – deferred tax	(6)	27	6
Change in deferred tax recognition	(293)	(802)	(165)
Adjustments to deferred tax balances arising from changes in tax rates	(9)	0	2,897
Other items	99	130	135
Income tax expense / (benefit)	1,198	1,345	4,242

Note 8 Income taxes (continued)

The components of operating profit before tax, and the differences between income tax expense reflected in the financial statements and the amounts calculated at the Swiss tax rate, are provided in the table on the previous page and explained below.

Non-Swiss tax rates differing from Swiss tax rate

To the extent that UBS AG profits or losses arise outside Switzerland, the applicable local tax rate may differ from the Swiss tax rate. This item reflects, for such profits, an adjustment from the tax expense that would arise at the Swiss tax rate to the tax expense that would arise at the applicable local tax rate. Similarly, it reflects, for such losses, an adjustment from the tax benefit that would arise at the Swiss tax rate to the tax benefit that would arise at the applicable local tax rate.

Tax effects of losses not recognized

This item relates to tax losses of entities arising in the year that are not recognized as DTAs. Consequently, no tax benefit arises in relation to those losses. Therefore, the tax benefit calculated by applying the local tax rate to those losses as described above is reversed.

Previously unrecognized tax losses now utilized

This item relates to taxable profits of the year that are offset by tax losses of previous years for which no DTAs were previously recorded. Consequently, no current tax or deferred tax expense arises in relation to those taxable profits. Therefore, the tax expense calculated by applying the local tax rate on those profits is reversed.

Non-taxable and lower taxed income

This item relates to tax deductions for the year in respect of permanent differences. These include deductions in respect of profits that are either not taxable or are taxable at a lower rate of tax than the local tax rate. They also include deductions made for tax purposes, which are not reflected in the accounts.

Non-deductible expenses and additional taxable income

This item relates to additional taxable income for the year in respect of permanent differences. These include income that is recognized for tax purposes by an entity, but is not included in its profit that is reported in the financial statements. In addition, they include expenses for the year that are non-deductible. For example, the costs of entertaining clients are not deductible in certain locations.

Adjustments related to prior years – current tax

This item relates to adjustments to current tax expense for prior years, e.g., if the tax payable for a year is agreed with the tax authorities in an amount that differs from the amount previously reflected in the financial statements.

Adjustments related to prior years – deferred tax

This item relates to adjustments to deferred tax positions recognized in prior years, e.g., if a tax loss for a year is fully recognized and the amount of the tax loss agreed with the tax authorities is expected to differ from the amount previously recognized as DTAs in the accounts.

Change in deferred tax recognition

This item relates to changes in DTAs, including those previously recognized resulting from reassessments of expected future taxable profits. It also includes changes in temporary differences in the year, for which deferred tax is not recognized.

Adjustments to deferred tax balances arising from changes in tax rates

This item relates to remeasurements of DTAs and liabilities recognized due to changes in tax rates. These have the effect of changing the future tax saving that is expected from tax losses or deductible tax differences and therefore the amount of DTAs recognized or, alternatively, changing the tax cost of additional taxable income from taxable temporary differences and therefore the deferred tax liability.

Other items

Other items include other differences between profits or losses at the local tax rate and the actual local tax expense or benefit, including movements in provisions for uncertain positions in relation to the current year and other items.

Note 8 Income taxes (continued)

Income tax recognized directly in equity

Certain tax expenses and benefits were recognized directly in equity during the year. These included the following items:

– a net tax expense of USD 327 million recognized in other comprehensive income (OCI) (2018: net benefit of USD 314 million), which included a tax expense of USD 253 million related to cash flow hedges (2018: benefit of USD 67 million), a tax expense of USD 41 million related to financial assets recognized at fair value through OCI (2018: benefit of USD 12 million), a tax expense of USD 1 million related to foreign currency translation gains and losses (2018: expense of USD 2 million), a tax expense of USD 41 million related to defined benefit pension plans (2018: benefit of USD 245 million) and a tax benefit of USD 8 million related to own credit (2018: expense of USD 8 million);
– a net tax benefit of USD 11 million recognized in share premium (2018: benefit of USD 5 million).

Deferred tax assets and liabilities

UBS AG has gross DTAs, valuation allowances and recognized DTAs related to tax loss carry-forwards and deductible temporary differences and also deferred tax liabilities in respect of taxable temporary differences as shown in the table below. The valuation allowances reflect DTAs that were not recognized because it was not considered probable that future taxable profits will be available to utilize the related tax loss carry-forwards and deductible temporary differences.

Of the recognized DTAs as of 31 December 2019, USD 9.3 billion related to the US and USD 0.2 billion related to other locations (as of 31 December 2018, USD 9.5 billion related to the US and USD 0.6 billion related to other locations).

The recognition of DTAs is supported by forecasts of taxable profits for the entities concerned. In addition, tax planning opportunities are available that would result in additional future taxable income and these would be utilized, if necessary.

As of 31 December 2019, UBS AG has recognized DTAs of USD 75 million (31 December 2018: USD 53 million) in respect of entities that incurred losses in either the current or preceding year.

USD million	31.12.19			31.12.18		
Deferred tax assets[1]	Gross	Valuation allowance	Recognized	Gross	Valuation allowance	Recognized
Tax loss carry-forwards	14,826	(8,861)	5,965	15,088	(8,989)	6,099
Temporary differences	4,158	(610)	3,548	4,526	(559)	3,967
of which: related to real estate costs capitalized for US tax purposes	*2,219*	*0*	*2,219*	*2,159*	*(25)*	*2,134*
of which: related to compensation and benefits	*1,075*	*(179)*	*896*	*1,146*	*(192)*	*954*
of which: related to trading assets	*99*	*(5)*	*93*	*390*	*(50)*	*339*
of which: related to investments in subsidiaries and goodwill	*0*	*0*	*0*	*179*	*0*	*179*
of which: other	*765*	*(426)*	*340*	*653*	*(292)*	*361*
Total deferred tax assets	18,984	(9,471)	9,513	19,614	(9,548)	10,066
Deferred tax liabilities						
Goodwill and intangible assets			29			26
Cash flow hedges			156			0
Other			126			62
Total deferred tax liabilities			311			88

1 Less deferred tax liabilities as applicable.

Note 8 Income taxes (continued)

Unrecognized tax loss carry-forwards

USD million	31.12.19	31.12.18
Within 1 year	13	0
From 2 to 5 years	609	464
From 6 to 10 years	14,712	16,297
From 11 to 20 years	4,030	4,457
No expiry	18,364	17,210
Total	37,728	38,428

As of 31 December 2019, USD 17.8 billion of the unrecognized tax losses carried forward related to the US, USD 14.9 billion related to the UK and USD 5.0 billion related to other locations (as of 31 December 2018, USD 20.0 billion related to the US, USD 14.2 billion related to the UK and USD 4.2 billion related to other locations).

In general, US federal tax losses incurred prior to 31 December 2017 can be carried forward for 20 years, and US federal tax losses incurred after 31 December 2017 and UK tax losses can be carried forward indefinitely. The amounts of US tax loss carry-forwards that are included in the above table are based on their amount for federal tax purposes rather than for state and local tax purposes.

Deferred tax liabilities are recognized in respect of investments in subsidiaries, branches and associates and interests in joint arrangements, except to the extent that UBS AG can control the timing of the reversal of the associated taxable temporary difference and it is probable that it will not reverse in the foreseeable future. However, as of 31 December 2019, this exception was not considered to apply to any taxable temporary differences.

Note 9 Earnings per share (EPS) and shares outstanding

In 2015, UBS AG shares were delisted from the SIX Swiss Exchange and the New York Stock Exchange. As of 31 December 2019, 100% of UBS AG's issued shares were held by UBS Group AG and therefore were not publicly traded. Accordingly, earnings per share information is not provided for UBS AG.

Balance sheet notes

Note 10 Financial assets at amortized cost and other positions in scope of expected credit loss measurement

The tables on the following pages provide information about financial instruments and certain other credit lines that are subject to expected credit loss (ECL) requirements. UBS has established ECL disclosure segments or "ECL segments" to disaggregate portfolios based on shared risk characteristics and on the same or similar rating methods applied. The key segments are presented in the table below.

→ **Refer to Note 23 for more information about expected credit loss measurement**

Segment	Segment description	Description of credit risk sensitivity	Business division / Corporate Center
Private clients with mortgages	Lending to private clients secured by owner-occupied real estate and personal account overdrafts of those clients	Sensitive to the interest rate environment, employment status and influence from regional effects (e.g., property values)	– Personal & Corporate Banking – Global Wealth Management
Real estate financing	Rental or income-producing real estate financing to private and corporate clients secured by real estate	Sensitive to GDP development, the interest rate environment and regional effects (e.g., property values)	– Personal & Corporate Banking – Global Wealth Management – Investment Bank
Large corporate clients	Lending to large corporate and multinational clients	Sensitive to GDP development, seasonality, business cycles and collateral values (diverse collateral including real estate and other collateral types)	– Personal & Corporate Banking – Investment Bank
SME clients	Lending to small and medium-sized corporate clients	Sensitive to GDP development, the interest rate environment and, to some extent, seasonality, business cycles and collateral values (diverse collateral including real estate and other collateral types)	– Personal & Corporate Banking
Lombard	Loans secured by pledges of marketable securities, guarantees and other forms of collateral	Sensitive to the market (e.g., changes in collateral as well as in invested assets)	– Global Wealth Management
Credit cards	Credit card solutions in Switzerland and the US	Sensitive to the interest rate environment and employment status	– Personal & Corporate Banking – Global Wealth Management
Commodity trade finance	Working capital financing of commodity traders, generally extended on a self-liquidating transactional basis	Sensitive primarily to the strength of individual transaction structures and collateral values (price volatility of commodities) as the primary source for debt service is directly linked to the shipments financed	– Personal & Corporate Banking
Financial intermediaries and hedge funds	Lending to financial institutions and pension funds, including exposures to broker-dealers and clearing houses	Sensitive to GDP development, the interest rate environment, regulatory changes and political risk	– Personal & Corporate Banking – Investment Bank – Corporate Center

→ **Refer to Note 23g for more details regarding sensitivity**

Note 10 Financial assets at amortized cost and other positions in scope of expected credit loss measurement (continued)

For amortized cost instruments, the net carrying amount represents the maximum exposure to credit risk, taking into account the allowance for credit losses. Financial assets measured at fair value through other comprehensive income (FVOCI) are also subject to ECL; however, unlike for amortized cost instruments, the allowance does not reduce the carrying amount of these financial assets. Rather, the carrying amount of financial assets measured at FVOCI represents the maximum exposure to credit risk.

No purchased credit-impaired financial assets have been recognized in the period. Originated credit-impaired financial assets were not material and are not presented in the table below and on the following page.

In addition to on-balance sheet financial assets, certain off-balance sheet financial instruments and other credit lines are also subject to ECL. The maximum exposure to credit risk for off-balance sheet financial instruments is calculated based on the maximum contractual amounts.

USD million	31.12.19							
	Carrying amount[1]				ECL allowances			
Financial instruments measured at amortized cost	Total	Stage 1	Stage 2	Stage 3	Total	Stage 1	Stage 2	Stage 3
Cash and balances at central banks	107,068	107,068	0	0	0	0	0	0
Loans and advances to banks	12,379	12,298	80	0	(6)	(4)	(1)	(1)
Receivables from securities financing transactions	84,245	84,245	0	0	(2)	(2)	0	0
Cash collateral receivables on derivative instruments	23,289	23,289	0	0	0	0	0	0
Loans and advances to customers	327,992	310,705	15,538	1,749	(764)	(82)	(123)	(559)
of which: Private clients with mortgages	*132,646*	*124,063*	*7,624*	*959*	*(110)*	*(15)*	*(55)*	*(41)*
of which: Real estate financing	*38,481*	*32,932*	*5,532*	*17*	*(43)*	*(5)*	*(34)*	*(4)*
of which: Large corporate clients	*9,703*	*9,184*	*424*	*94*	*(117)*	*(15)*	*(4)*	*(98)*
of which: SME clients	*11,786*	*9,817*	*1,449*	*521*	*(303)*	*(17)*	*(15)*	*(271)*
of which: Lombard	*112,893*	*112,796*	*0*	*98*	*(22)*	*(4)*	*0*	*(18)*
of which: Credit cards	*1,661*	*1,314*	*325*	*22*	*(35)*	*(8)*	*(14)*	*(13)*
of which: Commodity trade finance	*2,844*	*2,826*	*8*	*10*	*(81)*	*(5)*	*0*	*(77)*
Other financial assets measured at amortized cost	23,012	21,985	451	576	(143)	(35)	(13)	(95)
of which: Loans to financial advisors	*2,877*	*2,341*	*334*	*202*	*(109)*	*(29)*	*(11)*	*(70)*
Total financial assets measured at amortized cost	577,985	559,590	16,069	2,326	(915)	(124)	(137)	(655)
Financial assets measured at fair value through other comprehensive income	6,345	6,345	0	0	0	0	0	0
Total on-balance sheet financial assets in scope of ECL requirements	584,329	565,935	16,069	2,326	(915)	(124)	(137)	(655)

	Total exposure				ECL provisions			
Off-balance sheet (in scope of ECL)	Total	Stage 1	Stage 2	Stage 3	Total	Stage 1	Stage 2	Stage 3
Guarantees	18,142	17,757	304	82	(42)	(8)	(1)	(33)
of which: Large corporate clients	*3,687*	*3,461*	*203*	*24*	*(10)*	*(1)*	*0*	*(9)*
of which: SME clients	*1,180*	*1,055*	*67*	*58*	*(24)*	*0*	*0*	*(23)*
of which: Financial intermediaries and hedge funds	*7,966*	*7,950*	*16*	*0*	*(5)*	*(4)*	*0*	*0*
of which: Lombard	*622*	*622*	*0*	*0*	*(1)*	*0*	*0*	*(1)*
of which: Commodity trade finance	*2,334*	*2,320*	*13*	*0*	*(1)*	*(1)*	*0*	*0*
Irrevocable loan commitments	27,547	27,078	419	50	(35)	(30)	(5)	0
of which: Large corporate clients	*18,735*	*18,349*	*359*	*27*	*(27)*	*(24)*	*(3)*	*0*
Forward starting reverse repurchase and securities borrowing agreements	1,657	1,657	0	0	0	0	0	0
Committed unconditionally revocable credit lines	36,979	35,735	1,197	46	(34)	(17)	(17)	0
of which: Real estate financing	*5,242*	*4,934*	*307*	*0*	*(16)*	*(3)*	*(13)*	*0*
of which: Large corporate clients	*4,274*	*4,188*	*69*	*17*	*(1)*	*(1)*	*0*	*0*
of which: SME clients	*4,787*	*4,589*	*171*	*27*	*(9)*	*(8)*	*(1)*	*0*
of which: Lombard	*7,976*	*7,975*	*0*	*1*	*0*	*0*	*0*	*0*
of which: Credit cards	*7,890*	*7,535*	*355*	*0*	*(6)*	*(4)*	*(2)*	*0*
of which: Commodity trade finance	*344*	*344*	*0*	*0*	*0*	*0*	*0*	*0*
Irrevocable committed prolongation of existing loans	3,289	3,285	0	4	(3)	(3)	0	0
Total off-balance sheet financial instruments and other credit lines	87,614	85,513	1,920	182	(114)	(58)	(23)	(33)
Total allowances and provisions					(1,029)	(181)	(160)	(688)

1 The carrying amount of financial assets measured at amortized cost represents the total gross exposure net of the respective ECL allowances.

Note 10 Financial assets at amortized cost and other positions in scope of expected credit loss measurement (continued)

USD million	31.12.18							
	Carrying amount[1]				ECL allowances			
Financial instruments measured at amortized cost	Total	Stage 1	Stage 2	Stage 3	Total	Stage 1	Stage 2	Stage 3
Cash and balances at central banks	108,370	108,370	0	0	0	0	0	0
Loans and advances to banks	16,642	16,440	202	0	(7)	(4)	(1)	(3)
Receivables from securities financing transactions	95,349	95,349	0	0	(2)	(2)	0	0
Cash collateral receivables on derivative instruments	23,603	23,603	0	0	0	0	0	0
Loans and advances to customers	321,482	299,378	20,357	1,748	(772)	(69)	(155)	(549)
of which: Private clients with mortgages	*126,335*	*115,679*	*9,859*	*796*	*(138)*	*(16)*	*(83)*	*(39)*
of which: Real estate financing	*36,474*	*28,578*	*7,858*	*38*	*(59)*	*(3)*	*(40)*	*(16)*
of which: Large corporate clients	*11,390*	*10,845*	*457*	*88*	*(95)*	*(9)*	*(4)*	*(82)*
of which: SME clients	*9,924*	*8,029*	*1,263*	*632*	*(281)*	*(13)*	*(12)*	*(256)*
of which: Lombard	*111,722*	*111,707*	*0*	*14*	*(21)*	*(4)*	*0*	*(17)*
of which: Credit cards	*1,529*	*1,216*	*297*	*16*	*(30)*	*(6)*	*(13)*	*(11)*
of which: Commodity trade finance	*3,260*	*2,798*	*445*	*16*	*(86)*	*(5)*	*(3)*	*(78)*
Other financial assets measured at amortized cost	22,637	21,936	223	478	(155)	(43)	(4)	(109)
of which: Loans to financial advisors	*3,291*	*3,104*	*62*	*125*	*(113)*	*(34)*	*(2)*	*(77)*
Total financial assets measured at amortized cost	**588,084**	**565,076**	**20,782**	**2,226**	**(937)**	**(117)**	**(159)**	**(660)**
Financial assets measured at fair value through other comprehensive income	**6,667**	**6,667**	**0**	**0**	**0**	**0**	**0**	**0**
Total on-balance sheet financial assets in scope of ECL requirements	**594,750**	**571,743**	**20,782**	**2,226**	**(937)**	**(117)**	**(159)**	**(660)**
	Total exposure				ECL provisions			
Off-balance sheet (in scope of ECL)	Total	Stage 1	Stage 2	Stage 3	Total	Stage 1	Stage 2	Stage 3
Guarantees	18,146	17,321	611	215	(43)	(7)	(2)	(34)
of which: Large corporate clients	*3,862*	*3,599*	*136*	*127*	*(8)*	*(1)*	*(1)*	*(6)*
of which: SME clients	*1,298*	*1,057*	*164*	*77*	*(26)*	*0*	*0*	*(25)*
of which: Financial intermediaries and hedge funds	*7,193*	*7,125*	*67*	*0*	*(4)*	*(3)*	*0*	*0*
of which: Lombard	*834*	*834*	*0*	*0*	*0*	*0*	*0*	*0*
of which: Commodity trade finance	*2,097*	*1,851*	*236*	*11*	*(1)*	*(1)*	*0*	*0*
Irrevocable loan commitments	31,212	30,590	568	53	(37)	(32)	(5)	0
of which: Large corporate clients	*22,019*	*21,492*	*519*	*7*	*(31)*	*(26)*	*(4)*	*0*
Forward starting reverse repurchase and securities borrowing agreements	937	937	0	0	0	0	0	0
Committed unconditionally revocable credit lines	38,851	37,338	1,420	93	(36)	(19)	(16)	0
of which: Real estate financing	*2,562*	*2,150*	*401*	*11*	*(17)*	*(4)*	*(12)*	*0*
of which: Large corporate clients	*4,260*	*4,152*	*91*	*17*	*(2)*	*(1)*	*0*	*0*
of which: SME clients	*4,505*	*4,163*	*285*	*57*	*(7)*	*(6)*	*(1)*	*0*
of which: Lombard	*7,402*	*7,402*	*0*	*0*	*0*	*(1)*	*0*	*0*
of which: Credit cards	*7,343*	*7,035*	*309*	*0*	*(6)*	*(4)*	*(2)*	*0*
of which: Commodity trade finance	*3,467*	*3,209*	*254*	*4*	*(2)*	*(2)*	*0*	*0*
Irrevocable committed prolongation of existing loans	3,339	2,861	456	22	(1)	(1)	0	0
Total off-balance sheet financial instruments and other credit lines	**92,486**	**89,048**	**3,055**	**383**	**(116)**	**(59)**	**(23)**	**(34)**
Total allowances and provisions					**(1,054)**	**(176)**	**(183)**	**(695)**

1 The carrying amount of financial assets measured at amortized cost represents the total gross exposure net of the respective ECL allowances.

Note 10 Financial assets at amortized cost and other positions in scope of expected credit loss measurement (continued)

Coverage ratios are calculated by taking ECL allowances and provisions divided by the gross carrying amount of the exposures. These ratios have remained broadly unchanged in 2019 and are influenced by the following key factors:

- significant asset balances are held with central banks as part of the requirement to hold high-quality liquid assets;
- Lombard loans are secured with marketable securities in portfolios which are in general highly diversified with strict lending policies that are intended to ensure that credit risk is minimal under most circumstances;
- mortgage loans to private clients and real estate financing are controlled by conservative eligibility criteria, including low loan-to-value ratios and strong debt service capabilities. The risk of rising interest rates has been taken into account in the scenario selection process;
- the amount of unsecured retail lending (including credit cards) in Switzerland is insignificant;
- contractual maturities in the loan portfolio, which are a factor in the calculation of ECLs, are generally short, with a large part of the loan portfolio having contractual maturities of 12 month or less;
- for example, the carrying amount of Swiss residential mortgage loans would continue to be fully covered or 98% covered by real estate collateral, even if the value of that collateral decreased by 20% or 30%, respectively.

Certain assets reported in stage 2 within the *Private clients with mortgages* and *Real estate financing* segments did not have a comparable rating on origination upon which to base the assessment of whether a significant increase in credit risk (SICR) has occurred. In accordance with the IFRS 9 transition requirements, a lifetime ECL has been recognized for these assets. In the medium term and based on the current economic outlook, UBS expects the proportion of these stage 2 assets to reduce to some extent.

	31.12.19							
	Gross carrying amount (USD million)				ECL coverage (bps)			
Financial instruments measured at amortized cost	Total	Stage 1	Stage 2	Stage 3	Total	Stage 1	Stage 2	Stage 3
Loans and advances to customers	328,756	310,787	15,661	2,308	23	3	79	2,420
of which: Private clients with mortgages	*132,756*	*124,077*	*7,679*	*1,000*	*8*	*1*	*72*	*406*
of which: Real estate financing	*38,524*	*32,937*	*5,567*	*21*	*11*	*2*	*62*	*1,765*
of which: Large corporate clients	*9,819*	*9,199*	*429*	*192*	*119*	*16*	*100*	*5,088*
of which: SME clients	*12,089*	*9,834*	*1,464*	*791*	*251*	*18*	*104*	*3,420*
of which: Lombard	*112,915*	*112,799*	*0*	*116*	*2*	*0*	*0*	*1,566*
of which: Credit cards	*1,696*	*1,322*	*339*	*35*	*205*	*60*	*404*	*3,718*
of which: Commodity trade finance	*2,925*	*2,831*	*8*	*87*	*278*	*17*	*3*	*8,844*
Other financial assets measured at amortized cost	23,154	22,019	463	672	62	16	274	1,420
of which: Loans to financial advisors	*2,987*	*2,370*	*344*	*272*	*366*	*122*	*305*	*2,570*
Total financial assets measured at amortized cost	**578,899**	**559,714**	**16,206**	**2,981**	**16**	**2**	**84**	**2,198**
Financial assets measured at fair value through other comprehensive income	**6,345**	**6,345**	**0**	**0**	**0**	**0**	**0**	**0**
Total on-balance sheet financial assets in scope of ECL requirements	**585,245**	**566,059**	**16,206**	**2,981**	**16**	**2**	**84**	**2,198**

	Gross exposure (USD million)				ECL coverage (bps)			
Off-balance sheet (in scope of ECL)	Total	Stage 1	Stage 2	Stage 3	Total	Stage 1	Stage 2	Stage 3
Guarantees	18,142	17,757	304	82	23	4	30	4,032
Irrevocable loan commitments	27,547	27,078	419	50	13	11	120	0
Forward starting reverse repurchase and securities borrowing agreements	1,657	1,657	0	0	0	0	0	0
Committed unconditionally revocable credit lines	36,979	35,735	1,197	46	9	5	143	0
Irrevocable committed prolongation of existing loans	3,289	3,285	0	4	8	8	0	0
Total off-balance sheet financial instruments and other credit lines	**87,614**	**85,513**	**1,920**	**182**	**13**	**7**	**120**	**1,822**
Total allowances and provisions					**29**	**9**	**204**	**4,020**

Note 10 Financial assets at amortized cost and other positions in scope of expected credit loss measurement (continued)

As explained in Note 1a, the assessment of an SICR considers a number of qualitative and quantitative factors to determine if a stage transfer between stage 1 and stage 2 is required. The primary assessment considers changes in probability of default (PD) based on rating analyses and economic outlook. Additionally, UBS considers counterparties that have moved to a credit watch list and those with payments that are 30 days past due.

USD million	ECL allowances / provisions						
Financial instruments measured at amortized cost	Total	Stage 1	Stage 2	*of which: PD layer*	*of which: watch list*	*of which: ≥30 days past due*	Stage 3
Mortgages, business loans and related off-balance sheet commitments in the region Switzerland	723	89	137	*93*	*6*	*38*	497
of which: Private clients with mortgages	*88*	*11*	*53*	*40*	*0*	*13*	*27*
of which: Real estate financing	*59*	*8*	*47*	*36*	*0*	*11*	*4*
of which: Large corporate clients	*57*	*6*	*4*	*0*	*4*	*0*	*47*
of which: SME clients	*310*	*25*	*9*	*6*	*2*	*1*	*276*
of which: Lombard	*3*	*2*	*0*	*0*	*0*	*0*	*1*
of which: Leasing	*42*	*6*	*12*	*11*	*0*	*1*	*24*
of which: Credit cards	*33*	*9*	*11*	*0*	*0*	*11*	*12*
of which: Other	*128*	*23*	*2*	*2*	*0*	*0*	*106*

Derivatives: overview

A derivative is a financial instrument for which the value is derived from one or more variables (underlyings). Underlyings may be indices, foreign currency exchange or interest rates, or the value of shares, commodities, bonds or other financial instruments. A derivative commonly requires little or no initial net investment by either counterparty to the trade.

The majority of derivative contracts are negotiated with respect to notional amounts, tenor, price and settlement mechanisms, as is customary with other financial instruments.

Over-the-counter (OTC) derivative contracts are usually traded under a standardized International Swaps and Derivatives Association (ISDA) master agreement between UBS AG and its counterparties. Terms are negotiated directly with counterparties and the contracts have industry standard settlement mechanisms prescribed by ISDA. Beginning in 2016, regulators in various jurisdictions began a phased introduction of rules requiring the payment and collection of initial and variation margin on certain OTC derivative contracts, which may have a bearing on their price and other relevant terms. Under the final rules of the Basel Committee on Banking Supervision (BCBS) and the Board of the International Organization of Securities Commissions (IOSCO) promulgated in July 2019, the final phase-in of margin requirements for non-centrally cleared derivatives will be completed on 1 September 2021.

The industry continues to promote the use of central counterparties (CCPs) to clear OTC trades. The trend toward CCP clearing and settlement will generally facilitate the reduction of systemic credit exposures.

Other derivative contracts are standardized in terms of their amounts and settlement dates, and are bought and sold on regulated exchanges. These are commonly referred to as exchange-traded derivatives (ETD) contracts. Exchanges offer the benefits of pricing transparency, standardized daily settlement of changes in value and consequently reduced credit risk.

For presentation purposes, UBS AG's derivative contracts are subject to IFRS netting provisions. Derivative instruments are measured at fair value and generally classified on the balance sheet as *Derivative financial instruments* within *Assets* when having positive replacement values and *Derivative financial instruments* within *Liabilities* when having negative replacement values. However, ETD that are economically settled on a daily basis and OTC derivatives that are either legally settled or in substance net settled on a daily basis are classified as *Cash collateral receivables on derivative instruments* or *Cash collateral payables on derivative instruments*. Changes in the replacement values of derivatives are recorded in *Other net income from financial instruments measured at fair value through profit or loss,* except for interest on derivatives designated as hedging instruments in effective hedge accounting relationships and forward points on certain short- and long-duration foreign exchange contracts, which are recorded in *Net interest income*.

→ **Refer to Note 1a items 3j and 3k for more information**

→ **Refer to Note 25 for more information about derivative financial assets and liabilities after consideration of netting potential allowed under enforceable netting arrangements**

UBS AG uses various derivative instruments for both trading and hedging purposes. Derivative product types as well as valuation principles and techniques applied by UBS AG are described in Note 24. Positive replacement values represent the estimated amount UBS AG would receive if the derivative contract were sold on the balance sheet date. Negative replacement values indicate the estimated amount UBS AG would pay to transfer its obligations in respect of the underlying contract were it required or entitled to do so on the balance sheet date.

Derivatives embedded in other financial instruments are not included in the "Derivative instruments" table within this Note. Bifurcated embedded derivatives are presented on the same balance sheet line as the host contract. In cases where UBS AG applies the fair value option to hybrid instruments, bifurcation of an embedded derivative component is not required and as such this component is also not included in the "Derivative instruments" table.

→ **Refer to Notes 19 and 24 for more information**

Note 11 Derivative instruments (continued)

Risks of derivative instruments

Derivative instruments are transacted in many trading portfolios, which generally include several types of instruments, not just derivatives. The market risk of derivatives is predominantly managed and controlled as an integral part of the market risk of these portfolios. UBS AG's approach to market risk is described in the audited portions of "Market risk" in the "Risk management and control" section of this report.

Derivative instruments are also transacted with many different counterparties, most of whom are also counterparties for other types of business. The credit risk of derivatives is managed and controlled in the context of UBS AG's overall credit exposure to its counterparties. UBS AG's approach to credit risk is described in the audited portions of "Credit risk" in the "Risk management and control" section of this report. It should be noted that, although the derivative financial assets shown on the balance sheet can be an important component of UBS AG's credit exposure, the positive replacement values related to a respective counterparty are rarely an adequate reflection of UBS AG's credit exposure in its derivatives business with that counterparty. This is generally the case because, on the one hand, replacement values can increase over time (potential future exposure), while on the other hand, exposure may be mitigated by entering into master netting agreements and bilateral collateral arrangements. Both the exposure measures used internally by UBS AG to control credit risk and the capital requirements imposed by regulators reflect these additional factors.

→ **Refer to Note 25 for more information about derivative financial assets and liabilities after consideration of netting potential allowed under enforceable netting arrangements**

Note 11 Derivative instruments (continued)

Derivative instruments[1,2]

USD billion	31.12.19 Derivative financial assets	31.12.19 Notional values related to derivative financial assets[3]	31.12.19 Derivative financial liabilities	31.12.19 Notional values related to derivative financial liabilities[3]	31.12.19 Other notional values[3,4]	31.12.18 Derivative financial assets	31.12.18 Notional values related to derivative financial assets[3]	31.12.18 Derivative financial liabilities	31.12.18 Notional values related to derivative financial liabilities[3]	31.12.18 Other notional values[3,4]
Interest rate contracts										
Over-the-counter (OTC) contracts										
Forward contracts	0.0	2.8	0.3	5.1	3,136.8	0.0	1.4	0.1	3.1	2,873.9
Swaps	34.3	454.7	26.2	402.9	8,086.0	29.5	459.8	23.5	441.8	7,189.1
Options	8.1	464.8	10.0	486.1		7.6	562.2	9.0	550.0	
Exchange-traded contracts										
Futures					546.9					516.1
Options	0.0	84.4	0.0	66.6	229.5	0.0	27.7	0.0	26.3	199.7
Agency transactions[5]	0.1		0.1			0.0		0.1		
Total	42.6	1,006.6	36.6	960.7	11,999.2	37.1	1,051.1	32.7	1,021.3	10,778.8
Credit derivative contracts										
Over-the-counter (OTC) contracts										
Credit default swaps	1.7	65.0	2.2	66.0		1.7	68.8	2.1	73.2	
Total return swaps	0.3	2.0	0.8	3.3		0.2	3.0	0.6	3.7	
Options and warrants	0.0	3.3	0.0	0.6		0.0	2.7	0.0	1.4	
Total	2.0	70.2	3.0	69.9		1.9	74.5	2.7	78.3	
Foreign exchange contracts										
Over-the-counter (OTC) contracts										
Forward contracts	22.4	935.5	23.4	966.6		20.3	708.8	20.9	731.2	
Interest and currency swaps	22.8	1,573.2	23.8	1,418.5		24.8	1,299.7	24.6	1,203.5	
Options	7.3	660.9	6.8	604.9		8.3	613.8	7.8	577.4	
Exchange-traded contracts										
Futures					1.2					0.4
Options	0.0	4.0	0.0	3.8		0.0	3.6	0.0	5.3	
Agency transactions[5]	0.0		0.0			0.0		0.1		
Total	52.5	3,173.6	54.0	2,993.8	1.2	53.5	2,625.8	53.4	2,517.3	0.4
Equity / index contracts										
Over-the-counter (OTC) contracts										
Forward contracts	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Swaps	4.0	81.3	5.5	96.3		4.7	78.5	5.6	86.3	
Options	5.0	88.6	6.8	144.1		5.5	97.6	7.2	139.6	
Exchange-traded contracts										
Futures					84.9					71.7
Options	7.2	250.4	7.8	294.1	37.2	10.1	232.8	9.0	262.8	34.1
Agency transactions[5]	6.6		5.4			11.2		13.3		
Total	22.8	420.3	25.5	534.5	122.1	31.4	408.9	35.0	488.8	105.9

Table continues on the next page.

Note 11 Derivative instruments (continued)

Derivative instruments (continued)[1,2]

Table continued from the previous page.

	31.12.19					31.12.18				
USD billion	Derivative financial assets	Notional values related to derivative financial assets[3]	Derivative financial liabilities	Notional values related to derivative financial liabilities[3]	Other notional values[3,4]	Derivative financial assets	Notional values related to derivative financial assets[3]	Derivative financial liabilities	Notional values related to derivative financial liabilities[3]	Other notional values[3,4]
Commodity contracts										
Over-the-counter (OTC) contracts										
Forward contracts	0.1	4.2	0.2	5.7		0.1	3.2	0.1	3.4	
Swaps	0.4	13.8	0.6	15.1		0.7	15.2	0.4	9.9	
Options	1.0	27.4	0.4	23.6		0.4	18.6	0.3	16.1	
Exchange-traded contracts										
Futures					12.0					8.5
Forward contracts	0.0	5.9	0.0	4.9		0.0	6.6	0.0	5.4	
Options	0.1	4.8	0.1	10.7	0.6	0.1	2.9	0.0	3.7	0.1
Agency transactions[5]	0.3		0.5			0.4		0.7		
Total	1.8	56.1	1.7	60.0	12.6	1.8	46.4	1.5	38.5	8.6
Unsettled purchases of non-derivative financial instruments[6]	0.1	16.6	0.1	6.9		0.2	17.0	0.1	6.0	
Unsettled sales of non-derivative financial instruments[6]	0.1	15.4	0.1	9.7		0.4	15.1	0.2	13.2	
Total derivative instruments, based on IFRS netting[7]	121.8	4,758.9	120.9	4,635.4	12,135.1	126.2	4,238.7	125.7	4,163.4	10,893.6

1 Derivative financial liabilities as of 31 December 2019 include USD 17 million related to derivative loan commitments (31 December 2018: USD 17 million). No notional amounts related to these commitments are included in this table, but they are disclosed in Note 34 under Loan commitments. 2 Includes certain forward starting repurchase and reverse repurchase agreements that are classified as measured at fair value through profit or loss and are recognized within derivative instruments. The fair value of these derivative instruments was not material as of 31 December 2019 or 31 December 2018. No notional amounts related to these instruments are included in this table, but they are disclosed in Note 34 under Forward starting transactions. 3 In cases where derivative financial instruments are presented on a net basis on the balance sheet, the respective notional values of the netted derivative financial instruments are still presented on a gross basis. 4 Other notional values relate to derivatives that are cleared through either a central counterparty or an exchange. The fair value of these derivatives is presented on the balance sheet net of the corresponding cash margin under Cash collateral receivables on derivative instruments and Cash collateral payables on derivative instruments and was not material for all periods presented. 5 Notional values of exchange-traded agency transactions and OTC-cleared transactions entered into on behalf of clients are not disclosed as they have a significantly different risk profile. 6 Changes in the fair value of purchased and sold non-derivative financial instruments between trade date and settlement date are recognized as derivative financial instruments. 7 Financial assets and liabilities are presented net on the balance sheet if UBS AG has the unconditional and legally enforceable right to offset the recognized amounts, both in the normal course of business and in the event of default, bankruptcy or insolvency of the entity and all of the counterparties, and intends either to settle on a net basis or to realize the asset and settle the liability simultaneously. Refer to Note 25 for more information on netting arrangements.

The notional amount of a derivative is generally the quantity of the underlying instrument on which the derivative contract is based and is the reference against which changes in the value of the derivative are measured. Notional values in themselves are generally not a direct indication of the values that are exchanged between parties, and are therefore not a direct measure of risk or financial exposure but are viewed as an indication of the scale of the different types of derivatives entered into by UBS AG.

On a notional value basis, approximately 54% of OTC interest rate contracts held as of 31 December 2019 (31 December 2018: 56%) mature within one year, 28% (31 December 2018: 28%) within one to five years and 18% (31 December 2018: 16%) after five years. Notional values of interest rate contracts cleared with a clearing house that qualify for IFRS balance sheet netting or are legally settled on a daily basis are presented under *Other notional values* and are categorized into maturity buckets on the basis of contractual maturities of the cleared underlying derivative contracts.

Derivatives transacted for sales and trading purposes

Most of UBS AG's derivative transactions relate to sales and trading activities. Sales activities include the structuring and marketing of derivative products to customers to enable them to take, transfer, modify or reduce current or expected risks. Trading activities include market-making to directly support the facilitation and execution of client activity. Market-making involves quoting bid and offer prices to other market participants with the intention of generating revenues based on spread and volume.

Credit derivatives

UBS AG is an active dealer in the fixed income market, including credit default swaps (CDS) and related products, with respect to a large number of issuers' securities. The primary objectives of these activities are ongoing hedging of trading book exposures and market-making, primarily on behalf of clients.

Market-making activity, which is undertaken within the Investment Bank, consists of buying and selling single-name CDS, index CDS, loan CDS and related referenced cash instruments to facilitate client trading activity. UBS AG also actively utilizes CDS to economically hedge specific counterparty credit risks in its accrual and traded loan portfolios (including off-balance sheet loan commitments) with the aim of reducing concentrations in individual names, sectors or specific portfolios.

In addition, UBS AG actively utilizes CDS to economically hedge specific counterparty credit risks in its OTC derivative portfolios, including financial instruments that are designated at fair value through profit or loss.

The tables below provide more information about credit protection bought and sold, including replacement and notional value information by instrument type and counterparty type. The value of protection bought and sold is not, in isolation, a measure of UBS AG's credit risk. Counterparty relationships are viewed in terms of the total outstanding credit risk, which relates to other instruments in addition to CDS, and in connection with collateral arrangements in place. On a notional value basis, approximately 27% of credit protection bought and sold as of 31 December 2019 matures within one year (31 December 2018: 14%), approximately 63% within one to five years (31 December 2018: 74%) and approximately 10% after five years (31 December 2018: 12%).

Credit derivatives by type of instrument

	Protection bought			Protection sold		
USD billion	Derivative financial assets	Derivative financial liabilities	Notional values	Derivative financial assets	Derivative financial liabilities	Notional values
Single-name credit default swaps	0.3	0.7	37.5	0.8	0.7	38.6
Multi-name index-linked credit default swaps	0.1	0.8	29.3	0.5	0.1	24.9
Multi-name other credit default swaps	0.0	0.0	0.4	0.0	0.0	0.3
Total rate of return swaps	0.2	0.6	3.7	0.1	0.2	1.6
Options and warrants	0.0	0.0	3.8	0.0	0.0	0.1
Total 31 December 2019	0.7	2.1	74.6	1.3	0.9	65.4
of which: credit derivatives related to economic hedges	*0.6*	*1.7*	*56.1*	*0.9*	*0.8*	*45.7*
of which: credit derivatives related to market-making	*0.1*	*0.4*	*18.6*	*0.5*	*0.1*	*19.7*

	Protection bought			Protection sold		
USD billion	Derivative financial assets	Derivative financial liabilities	Notional values	Derivative financial assets	Derivative financial liabilities	Notional values
Single-name credit default swaps	0.6	0.6	43.3	0.5	1.0	44.9
Multi-name index-linked credit default swaps	0.3	0.3	29.1	0.3	0.2	24.4
Multi-name other credit default swaps	0.0	0.0	0.1	0.0	0.0	0.1
Total rate of return swaps	0.2	0.7	4.7	0.0	0.0	2.0
Options and warrants	0.0	0.0	4.1	0.0	0.0	0.1
Total 31 December 2018	1.1	1.6	81.3	0.8	1.2	71.4
of which: credit derivatives related to economic hedges	*0.9*	*1.3*	*59.2*	*0.5*	*1.1*	*48.9*
of which: credit derivatives related to market-making	*0.2*	*0.4*	*22.1*	*0.3*	*0.2*	*22.6*

Note 11 Derivative instruments (continued)

Credit derivatives by counterparty

	Protection bought			Protection sold		
USD billion	Derivative financial assets	Derivative financial liabilities	Notional values	Derivative financial assets	Derivative financial liabilities	Notional values
Broker-dealers	0.1	0.2	10.5	0.2	0.1	9.4
Banks	0.2	0.4	23.6	0.4	0.3	21.5
Central clearing counterparties	0.1	0.9	34.7	0.7	0.2	31.6
Other	0.3	0.7	5.8	0.1	0.3	2.9
Total 31 December 2019	0.7	2.1	74.6	1.3	0.9	65.4

	Protection bought			Protection sold		
USD billion	Derivative financial assets	Derivative financial liabilities	Notional values	Derivative financial assets	Derivative financial liabilities	Notional values
Broker-dealers	0.2	0.1	13.0	0.1	0.2	11.5
Banks	0.4	0.4	29.2	0.3	0.5	25.6
Central clearing counterparties	0.2	0.4	31.9	0.4	0.3	30.8
Other	0.3	0.7	7.2	0.0	0.3	3.5
Total 31 December 2018	1.1	1.6	81.3	0.8	1.2	71.4

UBS AG's CDS trades are documented using industry standard forms of documentation or equivalent terms documented in a bespoke agreement. The agreements that govern CDS generally do not contain recourse provisions that would enable UBS AG to recover from third parties any amounts paid out by UBS AG.

The types of credit events that would require UBS AG to perform under a CDS contract are subject to agreement between the parties at the time of the transaction. However, nearly all transactions are traded with reference to credit events that are applicable under certain market conventions based on the type of reference entity to which the transaction relates. Applicable credit events according to market conventions include bankruptcy, failure to pay, restructuring, obligation acceleration and repudiation / moratorium.

Contingent collateral features of derivative liabilities

Certain derivative instruments contain contingent collateral or termination features triggered upon a downgrade of the published credit ratings of UBS AG in the normal course of business. Based on UBS AG's credit ratings as of 31 December 2019, USD 0.0 billion, USD 0.3 billion and USD 0.8 billion would have been required for contractual obligations related to OTC derivatives in the event of a one-notch, two-notch and three-notch reduction in long-term credit ratings, respectively. In evaluating UBS AG's liquidity requirements, UBS AG considers additional collateral or termination payments that would be required in the event of a reduction in UBS AG's long-term credit ratings, and a corresponding reduction in UBS AG's short-term ratings.

Note 12 Financial assets and liabilities at fair value held for trading

USD million	31.12.19	31.12.18
Financial assets at fair value held for trading[1]		
Equity instruments	96,788	72,771
Government bills / bonds	11,464	11,161
Investment fund units	8,867	9,716
Corporate and municipal bonds	8,093	6,908
Loans	1,971	3,566
Asset-backed securities	512	392
Total financial assets at fair value held for trading	127,695	104,513
Financial liabilities at fair value held for trading[1]		
Equity instruments	22,734	21,892
Corporate and municipal bonds	3,661	3,530
Government bills / bonds	3,466	2,839
Investment fund units	698	689
Other	32	0
Total financial liabilities at fair value held for trading	30,591	28,949

1 Refer to Note 24c for more information on product type and fair value hierarchy categorization.

Note 13 Financial assets at fair value not held for trading

USD million	31.12.19	31.12.18
Financial assets at fair value not held for trading[1]		
Financial assets for unit-linked investment contracts	27,686	21,446
Corporate and municipal bonds	19,385	17,236
Government bills / bonds	15,790	22,493
Loans	11,438	8,132
Securities financing transactions	6,294	9,937
Auction rate securities	1,536	1,664
Investment fund units	432	407
Equity instruments	559	702
Other	515	369
Total financial assets at fair value not held for trading	83,636	82,387

1 Refer to Note 24c for more information on product type and fair value hierarchy categorization.

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Note 14 Financial assets measured at fair value through other comprehensive income

USD million	31.12.19	31.12.18
Financial assets measured at fair value through other comprehensive income[1]		
Debt instruments		
Government and government agencies	6,162	6,463
of which: USA	*5,814*	*6,101*
Banks	178	149
Corporates and other	4	54
Total financial assets measured at fair value through other comprehensive income	6,345	6,667
Unrealized gains – before tax	41	4
Unrealized (losses) – before tax	(25)	(146)
Net unrealized gains / (losses) – before tax	16	(143)
Net unrealized gains / (losses) – after tax	15	(104)

1 Refer to Note 24c for more information on product type and fair value hierarchy categorization. Refer also to Note 10 and Note 23 for more information on expected credit loss measurement.

Note 15 Property, equipment and software

At historical cost less accumulated depreciation

USD million	Owned properties	Leased properties[5]	Leasehold improvements	IT hardware and communication equipment	Internally generated software	Purchased software	Other machines and equipment	Projects in progress	2019	2018
Historical cost										
Balance at the end of the previous year	7,031		3,042	1,002	4,879	303	769	1,076	18,102	17,705
Adjustment from adoption of IFRS 16	(20)	3,299		(15)			0		3,264	
Balance at the beginning of the year	7,012	3,299	3,042	987	4,879	303	769	1,076	21,365	17,705
Additions	14	337	18	85	96	9	22	1,158	1,740	1,484
Disposals / write-offs[1]	(9)	(21)	(312)	(108)	(28)	(10)	(66)	0	(554)	(726)
Reclassifications	(135)	0	158	(3)	863	2	39	(1,315)	(391)[4]	(195)
Foreign currency translation	106	15	10	2	7	(1)	4	25	169	(166)
Balance at the end of the year	6,988	3,630	2,917	963	5,817	302	768	943	22,329	18,102
Accumulated depreciation										
Balance at the end of the previous year	4,132		1,842	733	2,161	209	546		9,623	9,514
Adjustment from adoption of IFRS 16	(1)	16		(15)			0		0	
Balance at the beginning of the year	4,131	16	1,842	719	2,161	209	546	0	9,623	9,514
Depreciation	141	463	184	98	565	33	58	0	1,542	984
Impairment[2]	1	2	1	0	27	2	0	0	34	67
Disposals / write-offs[1]	(9)	(2)	(310)	(108)	(28)	(10)	(66)	0	(533)	(730)
Reclassifications	(256)	0	3	0	5	0	0	0	(248)[4]	(124)
Foreign currency translation	66	3	9	1	5	(1)	3	0	86	(88)
Balance at the end of the year	4,074	481	1,729	710	2,735	233	541	0	10,503	9,623
Net book value										
Net book value at the end of the previous year	2,900	0	1,200	269	2,718	93	223	1,076	8,479	8,191
Net book value at the beginning of the year	2,881	3,284	1,200	268	2,718	93	223	1,076	11,742	8,191
Net book value at the end of the year	**2,914**	**3,149**	**1,188**	**254**	**3,082**	**69**	**227**	**943**[3]	11,826	**8,479**

1 Includes write-offs of fully depreciated assets. 2 Impairment charges recorded in 2019 generally relate to assets that are no longer used for which the recoverable amount based on a fair value approach was determined to be zero. 3 Consists of USD 744 million related to Internally generated software, USD 101 million related to Owned properties and USD 98 million related to Leasehold improvements. 4 Reflects reclassifications to Properties held for sale. 5 Represents right-of-use assets recognized by UBS AG as lessee. Includes immaterial leased IT equipment. The total cash outflow for leases during the year was USD 614 million. Interest expense on lease liabilities is included within Interest expense from financial instruments measured at amortized cost and Lease liabilities are included within Other financial liabilities measured at amortized cost. Refer to Notes 3 and 22a, respectively. Also refer to Note 1 for more information about the nature of UBS's leasing activities.

Note 16 Goodwill and intangible assets

Introduction

UBS AG performs an impairment test on its goodwill assets on an annual basis or when indicators of impairment exist.

UBS AG considers Asset Management and the Investment Bank, as they are reported in Note 2a, as separate cash-generating units, as that is the level at which the performance of investments (and the related goodwill) is reviewed and assessed by management. The goodwill for Global Wealth Management is separately monitored, and therefore separately considered for impairment, at the level of the two former business divisions Wealth Management and Wealth Management Americas. These business divisions were integrated in 2018 and are referred to in this Note as Global Wealth Management Americas and Global Wealth Management ex Americas.

The impairment test is performed for each cash-generating unit to which goodwill is allocated by comparing the recoverable amount, based on its value-in-use, with the carrying amount of the respective cash-generating unit. An impairment charge is recognized if the carrying amount exceeds the recoverable amount.

As of 31 December 2019, total goodwill recognized on the balance sheet was USD 6.3 billion, of which USD 3.7 billion was carried by the Global Wealth Management Americas cash-generating unit, USD 1.2 billion was carried by the Global Wealth Management ex Americas cash-generating unit and USD 1.4 billion was carried by Asset Management. Based on the impairment testing methodology described below, UBS AG concluded that the goodwill balances as of 31 December 2019 allocated to these cash-generating units are not impaired.

Impairment of the Investment Bank goodwill

UBS AG is continuing to realign its Investment Bank and execute on a number of strategic initiatives to drive profitable growth. As a consequence, IAS 36, *Impairment of Assets*, requires UBS AG to give consideration to the range of possible forecast cash flows and uncertainties in macroeconomic factors that currently exist when determining the recoverability of goodwill in the Investment Bank. Following this, UBS AG estimated a recoverable amount for the Investment Bank cash-generating unit of USD 11.7 billion. As this was lower than the carrying amount of the Investment Bank cash-generating unit of USD 12.1 billion (actual attributed equity as of 31 December 2019), UBS AG wrote down the goodwill previously recognized by the Investment Bank (USD 110 million) and recognized that charge in the income statement within *Amortization and impairment of goodwill and intangible assets*.

UBS AG also reviewed intangible assets, property, equipment and software assets, allocated to the Investment Bank. Overall, UBS AG confirmed that no further impairment charges were required, with the fair value of such assets (generally determined using a cost replacement approach) being equal to or higher than their respective carrying amounts.

Methodology for goodwill impairment testing

The recoverable amounts are determined using a discounted cash flow model, which has been adapted to use inputs that consider features of the banking business and its regulatory environment. The recoverable amount of a cash-generating unit is the sum of the discounted earnings attributable to shareholders from the first three forecast years and the terminal value, adjusted for the effect of the capital assumed to be needed over the next three years and to support growth beyond this period. The terminal value, which covers all periods beyond the third year, is calculated on the basis of the forecast of third-year profit, the discount rate and the long-term growth rate, as well as the implied perpetual capital growth.

The carrying amount for each cash-generating unit is determined by reference to the Group's equity attribution framework. Within this framework, which is described in the "Capital management" section of this report, UBS attributes equity to the businesses on the basis of their risk-weighted assets and leverage ratio denominator, their goodwill and intangible assets as well as equity directly associated with activity that Corporate Center – Group Treasury manages centrally on behalf of the business divisions. The framework is primarily used for purposes of measuring the performance of the businesses and includes certain management assumptions. Attributed equity equals the capital that a cash-generating unit requires to conduct its business and is currently considered a reasonable approximation of the carrying amount of the cash-generating units. The attributed equity methodology is aligned with the business planning process, the inputs from which are used in calculating the recoverable amounts of the respective cash-generating unit.

→ **Refer to the "Capital management" section of this report for more information about the equity attribution framework**

Assumptions

Valuation parameters used within UBS AG's impairment test model are linked to external market information, where applicable. The model used to determine the recoverable amount is most sensitive to changes in the forecast earnings available to shareholders in years one to three, to changes in the discount rates and to changes in the long-term growth rate. The applied long-term growth rate is based on long-term economic growth rates for different regions worldwide. Earnings available to shareholders are estimated on the basis of forecast results, which are part of the business plan approved by the Board of Directors.

The discount rates are determined by applying a capital asset pricing model-based approach, as well as considering quantitative and qualitative inputs from both internal and external analysts and the view of management.

Note 16 Goodwill and intangible assets (continued)

In addition, they take into account regional differences in risk-free rates, at the level of individual cash-generating units. Consistently, long-term growth rates are determined based on nominal or real GDP growth rate forecasts, depending on the region.

Key assumptions used to determine the recoverable amounts of each cash-generating unit are tested for sensitivity by applying a reasonably possible change to those assumptions. Forecast earnings available to shareholders were changed by 20%, the discount rates were changed by 1.5 percentage points and the long-term growth rates were changed by 0.75 percentage points. Under all scenarios, reasonably possible changes in key assumptions did not result in an impairment of goodwill or intangible balances reported by Global Wealth Management Americas, Global Wealth Management ex Americas and Asset Management.

If the estimated earnings and other assumptions in future periods deviate from the current outlook, the value of goodwill attributable to Global Wealth Management Americas, Global Wealth Management ex Americas and Asset Management may become impaired in the future, giving rise to losses in the income statement. Recognition of any impairment of goodwill would reduce IFRS equity and net profit. It would not affect cash flows and, as goodwill is required to be deducted from capital under the Basel III capital framework, no effect would be expected on UBS AG's capital ratios.

Discount and growth rates

	Discount rates		Growth rates	
In %	31.12.19	31.12.18	31.12.19	31.12.18
Global Wealth Management Americas	9.5	9.5	4.2	3.2
Global Wealth Management ex Americas	8.5	8.5	3.4	3.0
Asset Management	9.0	9.0	3.0	2.7
Investment Bank	11.0	11.0	4.0	3.5

	Goodwill	Intangible assets				
USD million	Total	Infrastructure[1]	Customer relationships, contractual rights and other	Total	2019	2018
Historical cost						
Balance at the beginning of the year	6,392	760	865	1,625	8,018	7,888
Additions	0		11	11	11	270
Disposals	(1)		(10)	(10)	(11)	(45)
Write-offs	0		(75)	(75)	(75)	(7)
Foreign currency translation	(9)		(3)	(3)	(12)	(88)
Balance at the end of the year	6,382	760	788	1,548	7,930	8,018
Accumulated amortization and impairment						
Balance at the beginning of the year		691	679	1,371	1,371	1,325
Amortization		38	27	65	65	62
Impairment[2]	110		0	0	110	4
Disposals			(8)	(8)	(8)	(1)
Write-offs			(75)	(75)	(75)	(7)
Foreign currency translation			(2)	(2)	(2)	(12)
Balance at the end of the year	110	730	621	1,351	1,461	1,371
Net book value at the end of the year	6,272	30	167	197	6,469	6,647

1 Consists of the branch network intangible asset recognized in connection with the acquisition of PaineWebber Group, Inc. 2 Impairment charges recorded in 2019 and 2018 relate to assets for which the recoverable amount was determined considering their value-in-use (recoverable amount of the impaired intangible assets in 2018 was USD 18 million, recoverable amount for the Investment Bank cash-generating unit in 2019 was USD 11.7 billion).

Note 16 Goodwill and intangible assets (continued)

The table below presents goodwill and intangible assets by cash-generating unit for the year ended 31 December 2019.

USD million	Global Wealth Management Americas	Global Wealth Management ex Americas	Asset Management	Investment Bank	Corporate Center	Total
Goodwill						
Balance at the beginning of the year	3,721	1,206	1,354	112		6,392
Additions					0	0
Disposals		(1)				(1)
Impairment				(110)		(110)
Foreign currency translation	(2)	(6)	1	(2)	0	(9)
Balance at the end of the year	3,719	1,198	1,354	0	0	6,272
Intangible assets						
Balance at the beginning of the year	138	104	0	11	1	254
Additions / transfers	1			0	10	11
Disposals		(2)		0		(2)
Amortization	(45)	(12)		(5)	(4)	(65)
Impairment		0		0		0
Foreign currency translation	(1)	1	0	0	0	(1)
Balance at the end of the year	92	92	0	5	7	197

The table below presents estimated aggregated amortization expenses for intangible assets.

USD million	Intangible assets
Estimated, aggregated amortization expenses for:	
2020	53
2021	22
2022	18
2023	17
2024	13
Thereafter	70
Not amortized due to indefinite useful life	2
Total	197

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Note 17 Other assets

a) Other financial assets measured at amortized cost

USD million	31.12.19	31.12.18
Debt securities	14,141	13,562
of which: government bills / bonds	*8,492*	*8,778*
Loans to financial advisors[1]	2,877	3,291
Fee- and commission-related receivables	1,520	1,644
Finance lease receivables[2]	1,444	1,091
Settlement and clearing accounts	587	1,039
Accrued interest income	742	700
Other	1,701	1,310
Total other financial assets measured at amortized cost	23,012	22,637

1 Related to financial advisors in the US and Canada. 2 Upon adoption of IFRS 16 on 1 January 2019, Finance lease receivables increased by USD 176 million. Refer to Note 1 for more information.

b) Other non-financial assets

USD million	31.12.19	31.12.18
Precious metals and other physical commodities	4,597	4,298
Bail deposit[1]	1,293	1,312
Prepaid expenses	687	731
VAT and other tax receivables	436	282
Properties and other non-current assets held for sale	199	82
Other	335	358
Total other non-financial assets	7,547	7,062

1 Refer to item 1 in Note 21b for more information.

Note 18 Amounts due to banks, customer deposits, and funding from UBS Group AG and its subsidiaries

a) Amounts due to banks and customer deposits

USD million	31.12.19	31.12.18
Amounts due to banks	6,570	10,962
Customer deposits	450,591	421,986
of which: demand deposits	*176,972*	*182,642*
of which: retail savings / deposits	*168,581*	*165,790*
of which: time deposits	*63,659*	*54,998*
of which: fiduciary deposits	*41,378*	*18,556*
Total amounts due to banks and customer deposits	457,161	432,948

b) Funding from UBS Group AG and its subsidiaries

USD million	31.12.19	31.12.18
Senior unsecured debt that contributes to total loss-absorbing capacity (TLAC)	30,105	29,988
Senior unsecured debt other than TLAC	3,389	1,031
High-trigger loss-absorbing additional tier 1 capital instruments	11,958	7,805
Low-trigger loss-absorbing additional tier 1 capital instruments	2,415	2,378
Total[1,2]	47,866	41,202

1 All balances in 2019 are against UBS Group AG as counterparty. Prior year balances were against UBS Group Funding (Switzerland) AG as counterparty. 2 UBS AG has also recognized funding from UBS Group AG and its subsidiaries that is designated at fair value. Refer to Note 22b for more information.

Note 19 Debt issued designated at fair value

USD million	31.12.19	31.12.18
Issued debt instruments		
Equity-linked[1]	41,722	34,392
Rates-linked	16,318	12,073
Credit-linked	1,916	3,282
Fixed-rate	4,636	5,099
Commodity-linked	1,567	1,785
Other	432	401
Total debt issued designated at fair value	66,592	57,031
of which: issued by UBS AG with original maturity greater than one year[2]	*51,031*	*40,289*
of which: life-to-date own credit (gain) / loss	*82*	*(270)*

1 Includes investment fund unit-linked instruments issued. 2 Issued by the legal entity UBS AG. Based on original contractual maturity without considering any early redemption features. More than 99% of the balance as of 31 December 2019 was unsecured (31 December 2018: more than 99% of the balance was unsecured).

As of 31 December 2019 and 31 December 2018, the contractual redemption amount at maturity of debt issued designated at fair value through profit or loss was not materially different from the carrying amount.

The table below shows the residual contractual maturity of the carrying amount of debt issued designated at fair value, split between fixed-rate and floating-rate instruments based on the contractual terms, and does not consider any early redemption features. Interest rate ranges for future interest payments related to debt issued designated at fair value have not been included in the table below as a majority of the debt instruments issued are structured products, and therefore the future interest payments are highly dependent upon the embedded derivative and prevailing market conditions at the point in time that each interest payment is made.

→ **Refer to Note 27 for maturity information on an undiscounted cash flow basis**

Contractual maturity of carrying amount

USD million	2020	2021	2022	2023	2024	2025–2029	Thereafter	Total 31.12.19	Total 31.12.18
UBS AG[1]									
Non-subordinated debt									
Fixed-rate	3,648	1,778	755	288	334	386	3,178	10,368	11,807
Floating-rate	21,547	10,748	3,435	2,608	3,290	8,109	5,562	55,299	43,562
Subtotal	25,195	12,526	4,190	2,897	3,624	8,495	8,740	65,668	55,370
Other subsidiaries[2]									
Non-subordinated debt									
Fixed-rate	48	92	6	0	0	345	29	520	1,230
Floating-rate	102	43	197	27	0	0	35	404	431
Subtotal	150	134	203	27	0	345	64	924	1,662
Total	25,345	12,661	4,394	2,924	3,624	8,840	8,804	66,592	57,031

1 Comprises instruments issued by the legal entity UBS AG. 2 Comprises instruments issued by subsidiaries of UBS AG.

Note 20 Debt issued measured at amortized cost

USD million	31.12.19	31.12.18
Certificates of deposit	5,190	7,980
Commercial paper	14,413	27,514
Other short-term debt	2,235	3,531
Short-term debt[1]	21,837	39,025
Senior unsecured debt	22,356	32,135
of which: issued by UBS AG with original maturity greater than one year[2]	*22,349*	*32,133*
Covered bonds	2,633	3,947
Subordinated debt	7,431	7,511
of which: low-trigger loss-absorbing tier 2 capital instruments	*6,892*	*6,808*
of which: non-Basel III-compliant tier 2 capital instruments	*540*	*703*
Debt issued through the Swiss central mortgage institutions	8,574	8,569
Other long-term debt	4	58
of which: issued by UBS AG with original maturity greater than one year[2]	*0*	*52*
Long-term debt[3]	40,998	52,220
Total debt issued measured at amortized cost[4]	62,835	91,245

1 Debt with an original contractual maturity of less than one year. 2 Issued by the legal entity UBS AG. Based on original contractual maturity without considering any early redemption features. As of 31 December 2019, 100% of the balance was unsecured (31 December 2018: 100% of the balance was unsecured). 3 Debt with an original maturity greater than or equal to one year. The classification of debt issued into short-term and long-term does not consider any early redemption features. 4 Net of bifurcated embedded derivatives, the fair value of which was not material for the periods presented.

UBS AG uses interest rate and foreign exchange derivatives to manage the risks inherent in certain debt instruments held at amortized cost. In certain cases, UBS AG applies hedge accounting for interest rate risk as discussed in Note 1a item 3j and Note 28. As a result of applying hedge accounting, the life-to-date adjustment to the carrying amount of debt issued was an increase of USD 574 million as of 31 December 2019 and an increase of USD 282 million as of 31 December 2018, reflecting changes in fair value due to interest rate movements.

Note 20 Debt issued measured at amortized cost (continued)

Subordinated debt consists of unsecured debt obligations that are contractually subordinated in right of payment to all other present and future non-subordinated obligations of the respective issuing entity. All of the subordinated debt instruments outstanding as of 31 December 2019 pay a fixed rate of interest.

The table below shows the residual contractual maturity of the carrying amount of debt issued, split between fixed-rate and floating-rate based on the contractual terms, and does not consider any early redemption features. The effects from interest rate swaps, which are used to hedge various fixed-rate debt issuances by changing the repricing characteristics into those similar to floating-rate debt, are also not considered in the table below.

→ **Refer to Note 27 for maturity information on an undiscounted cash flow basis**

Contractual maturity of carrying amount

USD million	2020	2021	2022	2023	2024	2025–2029	Thereafter	Total 31.12.19	Total 31.12.18
UBS AG[1]									
Non-subordinated debt									
Fixed-rate	24,334	3,978	2,618	1,621	0	0	1,145	33,696	40,108
Floating-rate	10,819	1,932	0	368	0	0	0	13,119	35,035
Subordinated debt									
Fixed-rate	0	0	2,007	0	2,597	2,827	0	7,431	7,511
Subtotal	35,153	5,910	4,626	1,989	2,597	2,827	1,145	54,247	82,654
Other subsidiaries[2]									
Non-subordinated debt									
Fixed-rate	758	1,029	851	951	1,013	3,327	660	8,588	8,590
Floating-rate	0	0	0	0	0	0	0	0	0
Subtotal	758	1,029	851	951	1,013	3,327	660	8,588	8,591
Total	35,911	6,939	5,477	2,940	3,610	6,154	1,805	62,835	91,245

1 Comprises debt issued by the legal entity UBS AG. 2 Comprises debt issued by subsidiaries of UBS AG.

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Note 21 Provisions and contingent liabilities

a) Provisions

The table below presents an overview of total provisions.

USD million	31.12.19	31.12.18
Provisions other than provisions for expected credit losses	2,825	3,341
Provisions for expected credit losses	114	116
Total provisions	2,938	3,457

The following table presents additional information for provisions other than provisions for expected credit losses.

USD million	Operational risks[2]	Litigation, regulatory and similar matters[3]	Restructuring	Real estate	Employee benefits[6]	Other	Total 2019	Total 2018
Balance at the end of the previous year	45	2,827	215	122	55	77	3,341	3,130
Adjustment from adoption of IFRS 16[1]	0	0	(103)	(28)	0	0	(131)	0
Balance at the beginning of the year	45	2,827	112	94	55	77	3,209	3,130
Additions from acquired companies	0	0	0	0	0	0	0	2
Increase in provisions recognized in the income statement	13	258	87	4	6	8	376	1,117
Release of provisions recognized in the income statement	0	(81)	(19)	0	(7)	(12)	(119)	(301)
Provisions used in conformity with designated purpose	(15)	(518)	(83)	(7)	0	(9)	(632)	(587)
Reclassifications	0	0	0	0	0	(1)	(1)	0
Foreign currency translation / unwind of discount	(1)	(12)	1	1	0	1	(8)	(20)
Balance at the end of the year	41	2,475	99[4]	92[5]	54	64	2,825	3,341

1 Refer to Note 1 for more information. 2 Comprises provisions for losses resulting from security risks and transaction processing risks. 3 Comprises provisions for losses resulting from legal, liability and compliance risks. 4 Primarily consists of personnel-related restructuring provisions of USD 33 million as of 31 December 2019 (31 December 2018: USD 40 million) and provisions for onerous contracts of USD 61 million as of 31 December 2019 (31 December 2018: USD 170 million). 5 Consists of reinstatement costs for leasehold improvements of USD 82 million as of 31 December 2019 (31 December 2018: USD 83 million) and provisions for onerous contracts of USD 10 million as of 31 December 2019 (31 December 2018: USD 40 million). 6 Includes provisions for sabbatical and anniversary awards.

Restructuring provisions primarily relate to onerous contracts and severance payments. Onerous contracts for property are recognized when UBS AG is committed to pay for non-lease components, such as utilities, when a property is vacated or not fully recovered from sub-tenants. Severance-related provisions are used within a short time period, usually within six months, but potential changes in amount may be triggered when natural staff attrition reduces the number of people affected by a restructuring event and therefore the estimated costs.

Information about provisions and contingent liabilities in respect of litigation, regulatory and similar matters, as a class, is included in Note 21b. There are no material contingent liabilities associated with the other classes of provisions.

b) Litigation, regulatory and similar matters

UBS operates in a legal and regulatory environment that exposes it to significant litigation and similar risks arising from disputes and regulatory proceedings. As a result, UBS (which for purposes of this Note may refer to UBS AG and/or one or more of its subsidiaries, as applicable) is involved in various disputes and legal proceedings, including litigation, arbitration, and regulatory and criminal investigations.

Such matters are subject to many uncertainties, and the outcome and the timing of resolution are often difficult to predict, particularly in the earlier stages of a case. There are also situations where UBS may enter into a settlement agreement. This may occur in order to avoid the expense, management distraction or reputational implications of continuing to contest liability, even for those matters for which UBS believes it should be exonerated. The uncertainties inherent in all such matters affect the amount and timing of any potential outflows for both matters with respect to which provisions have been established and other contingent liabilities. UBS makes provisions for such matters brought against it when, in the opinion of management after seeking legal advice, it is more likely than not that UBS has a present legal or constructive obligation as a result of past events, it is probable that an outflow of resources will be required, and the amount can be reliably estimated. Where these factors are otherwise satisfied, a provision may be established for claims that have not yet been asserted against UBS, but are nevertheless expected to be, based on UBS's experience with similar asserted claims. If any of those conditions is not met, such matters result in contingent liabilities. If the amount of an obligation cannot be reliably estimated, a liability exists that is not recognized even if an outflow of resources is probable. Accordingly, no provision is established even if the potential outflow of resources with respect to such matters could be significant. Developments relating to a matter that occur after the relevant reporting period, but prior to the issuance of financial statements, which affect management's assessment of the provision for such matter (because, for example, the developments provide evidence of conditions that existed at the end of the reporting period), are adjusting events after the reporting period under IAS 10 and must be recognized in the financial statements for the reporting period.

Specific litigation, regulatory and other matters are described below, including all such matters that management considers to be material and others that management believes to be of significance due to potential financial, reputational and other effects. The amount of damages claimed, the size of a transaction or other information is provided where available and appropriate in order to assist users in considering the magnitude of potential exposures.

Note 21 Provisions and contingent liabilities (continued)

In the case of certain matters below, we state that we have established a provision, and for the other matters, we make no such statement. When we make this statement and we expect disclosure of the amount of a provision to prejudice seriously our position with other parties in the matter because it would reveal what UBS believes to be the probable and reliably estimable outflow, we do not disclose that amount. In some cases we are subject to confidentiality obligations that preclude such disclosure. With respect to the matters for which we do not state whether we have established a provision, either (a) we have not established a provision, in which case the matter is treated as a contingent liability under the applicable accounting standard; or (b) we have established a provision but expect disclosure of that fact to prejudice seriously our position with other parties in the matter because it would reveal the fact that UBS believes an outflow of resources to be probable and reliably estimable.

With respect to certain litigation, regulatory and similar matters for which we have established provisions, we are able to estimate the expected timing of outflows. However, the aggregate amount of the expected outflows for those matters for which we are able to estimate expected timing is immaterial relative to our current and expected levels of liquidity over the relevant time periods.

The aggregate amount provisioned for litigation, regulatory and similar matters as a class is disclosed in the "Provisions" table in Note 21a above. It is not practicable to provide an aggregate estimate of liability for our litigation, regulatory and similar matters as a class of contingent liabilities. Doing so would require us to provide speculative legal assessments as to claims and proceedings that involve unique fact patterns or novel legal theories, that have not yet been initiated or are at early stages of adjudication, or as to which alleged damages have not been quantified by the claimants. Although we therefore cannot provide a numerical estimate of the future losses that could arise from litigation, regulatory and similar matters, we believe that the aggregate amount of possible future losses from this class that are more than remote substantially exceeds the level of current provisions.

Litigation, regulatory and similar matters may also result in non-monetary penalties and consequences. For example, the non-prosecution agreement described in item 5 of this Note, which we entered into with the US Department of Justice (DOJ), Criminal Division, Fraud Section in connection with our submissions of benchmark interest rates, including, among others, the British Bankers' Association London Interbank Offered Rate (LIBOR), was terminated by the DOJ based on its determination that we had committed a US crime in relation to foreign exchange matters. As a consequence, UBS AG pleaded guilty to one count of wire fraud for conduct in the LIBOR matter, paid a fine and was subject to probation, which ended in early January 2020.

A guilty plea to, or conviction of, a crime could have material consequences for UBS. Resolution of regulatory proceedings may require us to obtain waivers of regulatory disqualifications to maintain certain operations, may entitle regulatory authorities to limit, suspend or terminate licenses and regulatory authorizations, and may permit financial market utilities to limit, suspend or terminate our participation in such utilities. Failure to obtain such waivers, or any limitation, suspension or termination of licenses, authorizations or participations, could have material consequences for UBS.

The risk of loss associated with litigation, regulatory and similar matters is a component of operational risk for purposes of determining our capital requirements. Information concerning our capital requirements and the calculation of operational risk for this purpose is included in the "Capital management" section of this report.

Provisions for litigation, regulatory and similar matters by business division and in Corporate Center[1]

USD million	Global Wealth Manage-ment	Personal & Corporate Banking	Asset Manage-ment	Investment Bank	Corporate Center	Total 2019	Total 2018
Balance at the beginning of the year	1,003	117	0	269	1,438	2,827	2,508
Increase in provisions recognized in the income statement	188	1	0	60	10	258	905
Release of provisions recognized in the income statement	(49)	0	0	(6)	(27)	(81)	(220)
Provisions used in conformity with designated purpose	(350)	(4)	0	(66)	(97)	(518)	(350)
Foreign currency translation / unwind of discount	(10)	(1)	0	(2)	0	(12)	(16)
Balance at the end of the year	782	113	0	255	1,325	2,475	2,827

1 Provisions, if any, for the matters described in this Note are recorded in Global Wealth Management (items 3, item 4 and item 7) and Corporate Center (item 2). Provisions, if any, for the matters described in items 1 and 6 of this disclosure are allocated between Global Wealth Management and Personal & Corporate Banking, and provisions, if any, for the matters described in this disclosure in item 5 are allocated between the Investment Bank and Corporate Center.

1. Inquiries regarding cross-border wealth management businesses

Tax and regulatory authorities in a number of countries have made inquiries, served requests for information or examined employees located in their respective jurisdictions relating to the cross-border wealth management services provided by UBS and other financial institutions. It is possible that the implementation of automatic tax information exchange and other measures relating to cross-border provision of financial services could give rise to further inquiries in the future. UBS has received disclosure orders from the Swiss Federal Tax Administration (FTA) to transfer information based on requests for international administrative assistance in tax matters. The requests concern a number of UBS account numbers pertaining to current and former clients and are based on data from 2006 and 2008. UBS has taken steps to inform affected clients about the administrative assistance proceedings and their procedural rights, including the right to appeal. The requests are based on data received from the German authorities, who seized certain data related to UBS clients booked in Switzerland during their investigations and have apparently shared this data with other European countries. UBS expects additional countries to file similar requests.

The Swiss Federal Administrative Court ruled in 2016 that, in the administrative assistance proceedings related to a French bulk request, UBS has the right to appeal all final FTA client data disclosure orders. On 30 July 2018, the Swiss Federal Administrative Court granted UBS's appeal by holding the French administrative assistance request inadmissible. The FTA filed a final appeal with the Swiss Federal Supreme Court. On 26 July 2019, the Supreme Court reversed the decision of the Federal Administrative Court. In December 2019, the court released its written decision. The decision requires the FTA to obtain confirmation from the French authorities that transmitted data will be used only for the purposes stated in their request before transmitting any data. The stated purpose of the original request was to obtain information relating to taxes owed by account holders. Accordingly, any information transferred to the French authorities must not be passed to criminal authorities or used in connection with the ongoing case against UBS discussed in this item.

Since 2013, UBS (France) S.A., UBS AG and certain former employees have been under investigation in France for alleged complicity in unlawful solicitation of clients on French territory, regarding the laundering of proceeds of tax fraud, and banking and financial solicitation by unauthorized persons. In connection with this investigation, the investigating judges ordered UBS AG to provide bail ("caution") of EUR 1.1 billion and UBS (France) S.A. to post bail of EUR 40 million, which was reduced on appeal to EUR 10 million.

A trial in the court of first instance took place from 8 October 2018 until 15 November 2018. On 20 February 2019, the court announced a verdict finding UBS AG guilty of unlawful solicitation of clients on French territory and aggravated laundering of the proceeds of tax fraud, and UBS (France) S.A. guilty of aiding and abetting unlawful solicitation and laundering the proceeds of tax fraud. The court imposed fines aggregating EUR 3.7 billion on UBS AG and UBS (France) S.A. and awarded EUR 800 million of civil damages to the French state. UBS has appealed the decision. Under French law, the judgment is suspended while the appeal is pending. The trial in the Court of Appeal is scheduled for June 2020. The Court of Appeal will retry the case de novo as to both the law and the facts, and the fines and penalties can be greater than or less than those imposed by the court of first instance. A subsequent appeal to the Cour de Cassation, France's highest court, is possible with respect to questions of law.

UBS believes that based on both the law and the facts the judgment of the court of first instance should be reversed. UBS believes it followed its obligations under Swiss and French law as well as the European Savings Tax Directive. Even assuming liability, which it contests, UBS believes the penalties and damage amounts awarded greatly exceed the amounts that could be supported by the law and the facts. In particular, UBS believes the court incorrectly based the penalty on the total regularized assets rather than on any unpaid taxes on those assets for which a fraud has been characterized and further incorrectly awarded damages based on costs that were not proven by the civil party. Notwithstanding that UBS believes it should be acquitted, our balance sheet at 31 December 2019 reflected provisions with respect to this matter in an amount of EUR 450 million (USD 505 million at 31 December 2019). The wide range of possible outcomes in this case contributes to a high degree of estimation uncertainty. The provision reflected on our balance sheet at 31 December 2019 reflects our best estimate of possible financial implications, although it is reasonably possible that actual penalties and civil damages could exceed the provision amount.

In 2016, UBS was notified by the Belgian investigating judge that it is under formal investigation ("inculpé") regarding the laundering of proceeds of tax fraud, of banking and financial solicitation by unauthorized persons, and of serious tax fraud. In 2018, tax authorities and a prosecutor's office in Italy asserted that UBS is potentially liable for taxes and penalties as a result of its activities in Italy from 2012 to 2017. In June 2019, UBS entered into a settlement agreement with the Italian tax authorities under which it paid EUR 101 million to resolve the claims asserted by the authority related to UBS AG's potential permanent establishment in Italy. In October 2019, the Judge of Preliminary Investigations of the Milan Court approved an agreement with the Milan prosecutor under Article 63 of Italian Administrative Law 231 under which UBS AG, UBS Switzerland AG and UBS Monaco have paid an aggregate of EUR 10.3 million to resolve claims premised on the alleged inadequacy of historical internal controls. No admission of wrongdoing was required in connection with this resolution.

Note 21 Provisions and contingent liabilities (continued)

Our balance sheet at 31 December 2019 reflected provisions with respect to matters described in this item 1 in an amount that UBS believes to be appropriate under the applicable accounting standard. As in the case of other matters for which we have established provisions, the future outflow of resources in respect of such matters cannot be determined with certainty based on currently available information and accordingly may ultimately prove to be substantially greater (or may be less) than the provision that we have recognized.

2. Claims related to sales of residential mortgage-backed securities and mortgages

From 2002 through 2007, prior to the crisis in the US residential loan market, UBS was a substantial issuer and underwriter of US residential mortgage-backed securities (RMBS) and was a purchaser and seller of US residential mortgages. A subsidiary of UBS, UBS Real Estate Securities Inc. (UBS RESI), acquired pools of residential mortgage loans from originators and (through an affiliate) deposited them into securitization trusts. In this manner, from 2004 through 2007, UBS RESI sponsored approximately USD 80 billion in RMBS, based on the original principal balances of the securities issued.

UBS RESI also sold pools of loans acquired from originators to third-party purchasers. These whole loan sales during the period 2004 through 2007 totaled approximately USD 19 billion in original principal balance.

UBS was not a significant originator of US residential loans. A branch of UBS originated approximately USD 1.5 billion in US residential mortgage loans during the period in which it was active from 2006 to 2008 and securitized less than half of these loans.

Lawsuits related to contractual representations and warranties concerning mortgages and RMBS: When UBS acted as an RMBS sponsor or mortgage seller, it generally made certain representations relating to the characteristics of the underlying loans. In the event of a material breach of these representations, UBS was in certain circumstances contractually obligated to repurchase the loans to which the representations related or to indemnify certain parties against losses. In 2012, certain RMBS trusts filed an action in the US District Court for the Southern District of New York seeking to enforce UBS RESI's obligation to repurchase loans in the collateral pools for three RMBS securitizations issued and underwritten by UBS with an original principal balance of approximately USD 2 billion. In July 2018, UBS and the trustee entered into an agreement under which UBS will pay USD 850 million to resolve this matter. A significant portion of this amount will be borne by other parties that indemnified UBS. In January 2020, the settlement was approved by the court. Proceedings to determine how the settlement funds will be distributed to RMBS holders are ongoing. After giving effect to this settlement, UBS considers claims relating to substantially all loan repurchase demands to be resolved and believes that new demands to repurchase US residential mortgage loans are time-barred under a decision rendered by the New York Court of Appeals.

Mortgage-related regulatory matters: Since 2014, the US Attorney's Office for the Eastern District of New York has sought information from UBS pursuant to the Financial Institutions Reform, Recovery and Enforcement Act of 1989 (FIRREA), related to UBS's RMBS business from 2005 through 2007. On 8 November 2018, the DOJ filed a civil complaint in the District Court for the Eastern District of New York. The complaint seeks unspecified civil monetary penalties under FIRREA related to UBS's issuance, underwriting and sale of 40 RMBS transactions in 2006 and 2007. UBS moved to dismiss the civil complaint on 6 February 2019. On 10 December 2019, the district court denied UBS's motion to dismiss.

Our balance sheet at 31 December 2019 reflected a provision with respect to matters described in this item 2 in an amount that UBS believes to be appropriate under the applicable accounting standard. As in the case of other matters for which we have established provisions, the future outflow of resources in respect of this matter cannot be determined with certainty based on currently available information and accordingly may ultimately prove to be substantially greater (or may be less) than the provision that we have recognized.

3. Madoff

In relation to the Bernard L. Madoff Investment Securities LLC (BMIS) investment fraud, UBS AG, UBS (Luxembourg) S.A. (now UBS Europe SE, Luxembourg branch) and certain other UBS subsidiaries have been subject to inquiries by a number of regulators, including the Swiss Financial Market Supervisory Authority (FINMA) and the Luxembourg Commission de Surveillance du Secteur Financier. Those inquiries concerned two third-party funds established under Luxembourg law, substantially all assets of which were with BMIS, as well as certain funds established in offshore jurisdictions with either direct or indirect exposure to BMIS. These funds faced severe losses, and the Luxembourg funds are in liquidation. The documentation establishing both funds identifies UBS entities in various roles, including custodian, administrator, manager, distributor and promoter, and indicates that UBS employees serve as board members.

In 2009 and 2010, the liquidators of the two Luxembourg funds filed claims against UBS entities, non-UBS entities and certain individuals, including current and former UBS employees, seeking amounts totaling approximately EUR 2.1 billion, which includes amounts that the funds may be held liable to pay the trustee for the liquidation of BMIS (BMIS Trustee).

A large number of alleged beneficiaries have filed claims against UBS entities (and non-UBS entities) for purported losses relating to the Madoff fraud. The majority of these cases have been filed in Luxembourg, where decisions that the claims in eight test cases were inadmissible have been affirmed by the Luxembourg Court of Appeal, and the Luxembourg Supreme Court has dismissed a further appeal in one of the test cases.

In the US, the BMIS Trustee filed claims against UBS entities, among others, in relation to the two Luxembourg funds and one of the offshore funds. The total amount claimed against all defendants in these actions was not less than USD 2 billion. In 2014, the US Supreme Court rejected the BMIS Trustee's motion for leave to appeal decisions dismissing all claims except those for the recovery of approximately USD 125 million of payments alleged to be fraudulent conveyances and preference payments. In 2016, the bankruptcy court dismissed these claims against the UBS entities. In February 2019, the Court of Appeals reversed the dismissal of the BMIS Trustee's remaining claims. In August 2019, the defendants, including UBS, filed a petition to the US Supreme Court requesting that it review the Court of Appeals' decision. The bankruptcy proceedings have been stayed pending a decision with respect to the defendants' petition.

4. Puerto Rico

Declines since 2013 in the market prices of Puerto Rico municipal bonds and of closed-end funds (funds) that are sole-managed and co-managed by UBS Trust Company of Puerto Rico and distributed by UBS Financial Services Incorporated of Puerto Rico (UBS PR) have led to multiple regulatory inquiries, as well as customer complaints and arbitrations with aggregate claimed damages of USD 3.4 billion, of which claims with aggregate claimed damages of USD 2.4 billion have been resolved through settlements, arbitration or withdrawal of the claim. The claims have been filed by clients in Puerto Rico who own the funds or Puerto Rico municipal bonds and/or who used their UBS account assets as collateral for UBS non-purpose loans; customer complaint and arbitration allegations include fraud, misrepresentation and unsuitability of the funds and of the loans.

A shareholder derivative action was filed in 2014 against various UBS entities and current and certain former directors of the funds, alleging hundreds of millions of US dollars in losses in the funds. In 2015, defendants' motion to dismiss was denied and a request for permission to appeal that ruling was denied by the Puerto Rico Supreme Court. In 2014, a federal class action complaint also was filed against various UBS entities, certain members of UBS PR senior management and the co-manager of certain of the funds, seeking damages for investor losses in the funds during the period from May 2008 through May 2014. Following denial of the plaintiffs' motion for class certification, the case was dismissed in October 2018.

In 2014 and 2015, UBS entered into settlements with the Office of the Commissioner of Financial Institutions for the Commonwealth of Puerto Rico, the US Securities and Exchange Commission (SEC) and the Financial Industry Regulatory Authority in relation to their examinations of UBS's operations.

In 2011, a purported derivative action was filed on behalf of the Employee Retirement System of the Commonwealth of Puerto Rico (System) against over 40 defendants, including UBS PR, which was named in connection with its underwriting and consulting services. Plaintiffs alleged that defendants violated their purported fiduciary duties and contractual obligations in connection with the issuance and underwriting of USD 3 billion of bonds by the System in 2008 and sought damages of over USD 800 million. In 2016, the court granted the System's request to join the action as a plaintiff, but ordered that plaintiffs must file an amended complaint. In 2017, the court denied defendants' motion to dismiss the amended complaint.

Beginning in 2015, and continuing through 2017, certain agencies and public corporations of the Commonwealth of Puerto Rico (Commonwealth) defaulted on certain interest payments on Puerto Rico bonds. In 2016, US federal legislation created an oversight board with power to oversee Puerto Rico's finances and to restructure its debt. The oversight board has imposed a stay on the exercise of certain creditors' rights. In 2017, the oversight board placed certain of the bonds into a bankruptcy-like proceeding under the supervision of a Federal District Judge. These events, further defaults or any further legislative action to create a legal means of restructuring Commonwealth obligations or to impose additional oversight on the Commonwealth's finances, or any restructuring of the Commonwealth's obligations, may increase the number of claims against UBS concerning Puerto Rico securities, as well as potential damages sought.

In May 2019, the oversight board filed complaints in Puerto Rico federal district court bringing claims against financial, legal and accounting firms that had participated in Puerto Rico municipal bond offerings, including UBS, seeking a return of underwriting and swap fees paid in connection with those offerings. UBS estimates that it received approximately USD 125 million in fees in the relevant offerings.

In August 2019 and February 2020, three US insurance companies that insured issues of Puerto Rico municipal bonds sued UBS and seven other underwriters of Puerto Rico municipal bonds. The two actions seek recovery of an aggregate of USD 955 million in damages from the defendants. The plaintiffs in these cases claim that defendants failed to reasonably investigate financial statements in the offering materials for the insured Puerto Rico bonds issued between 2002 and 2007, which plaintiffs argue they relied upon in agreeing to insure the bonds notwithstanding that they had no contractual relationship with the underwriters.

Note 21 Provisions and contingent liabilities (continued)

Our balance sheet at 31 December 2019 reflected provisions with respect to matters described in this item 4 in amounts that UBS believes to be appropriate under the applicable accounting standard. As in the case of other matters for which we have established provisions, the future outflow of resources in respect of such matters cannot be determined with certainty based on currently available information and accordingly may ultimately prove to be substantially greater (or may be less) than the provisions that we have recognized.

5. Foreign exchange, LIBOR and benchmark rates, and other trading practices

Foreign exchange-related regulatory matters: Beginning in 2013, numerous authorities commenced investigations concerning possible manipulation of foreign exchange markets and precious metals prices. In 2014 and 2015, UBS reached settlements with the UK Financial Conduct Authority (FCA) and the US Commodity Futures Trading Commission (CFTC) in connection with their foreign exchange investigations, FINMA issued an order concluding its formal proceedings relating to UBS's foreign exchange and precious metals businesses, and the Board of Governors of the Federal Reserve System (Federal Reserve Board) and the Connecticut Department of Banking issued a Cease and Desist Order and assessed monetary penalties against UBS AG. In 2015, the DOJ's Criminal Division terminated the 2012 non-prosecution agreement with UBS AG related to UBS's submissions of benchmark interest rates, and UBS AG pleaded guilty to one count of wire fraud, paid a fine and was subject to probation, which ended in early January 2020. In 2019 the European Commission announced two decisions with respect to foreign exchange trading. UBS was granted immunity by the European Commission in these matters and therefore was not fined. UBS has ongoing obligations to cooperate with these authorities and to undertake certain remediation measures. UBS has also been granted conditional immunity by the Antitrust Division of the DOJ and by authorities in other jurisdictions in connection with potential competition law violations relating to foreign exchange and precious metals businesses. Investigations relating to foreign exchange matters by certain authorities remain ongoing notwithstanding these resolutions.

Foreign exchange-related civil litigation: Putative class actions have been filed since 2013 in US federal courts and in other jurisdictions against UBS and other banks on behalf of putative classes of persons who engaged in foreign currency transactions with any of the defendant banks. UBS has resolved US federal court class actions relating to foreign currency transactions with the defendant banks and persons who transacted in foreign exchange futures contracts and options on such futures under a settlement agreement that provides for UBS to pay an aggregate of USD 141 million and provide cooperation to the settlement classes. Certain class members have excluded themselves from that settlement and have filed individual actions in US and English courts against UBS and other banks, alleging violations of US and European competition laws and unjust enrichment.

In 2015, a putative class action was filed in federal court against UBS and numerous other banks on behalf of persons and businesses in the US who directly purchased foreign currency from the defendants and alleged co-conspirators for their own end use. In March 2017, the court granted UBS's (and the other banks') motions to dismiss the complaint. The plaintiffs filed an amended complaint in August 2017. In March 2018, the court denied the defendants' motions to dismiss the amended complaint.

In 2017, two putative class actions were filed in federal court in New York against UBS and numerous other banks on behalf of persons and entities who had indirectly purchased foreign exchange instruments from a defendant or co-conspirator in the US, and a consolidated complaint was filed in June 2017. In March 2018, the court dismissed the consolidated complaint. In October 2018, the court granted plaintiffs' motion seeking leave to file an amended complaint. In January 2020, UBS and 11 other banks agreed in principle with the plaintiffs to settle the class action for a total of USD 10 million. The settlement is subject to final documentation and court approval.

LIBOR and other benchmark-related regulatory matters: Numerous government agencies, including the SEC, the CFTC, the DOJ, the FCA, the UK Serious Fraud Office, the Monetary Authority of Singapore, the Hong Kong Monetary Authority, FINMA, various state attorneys general in the US and competition authorities in various jurisdictions, have conducted investigations regarding potential improper attempts by UBS, among others, to manipulate LIBOR and other benchmark rates at certain times. UBS reached settlements or otherwise concluded investigations relating to benchmark interest rates with the investigating authorities. UBS has ongoing obligations to cooperate with the authorities with whom we have reached resolutions and to undertake certain remediation measures with respect to benchmark interest rate submissions. UBS has been granted conditional leniency or conditional immunity from authorities in certain jurisdictions, including the Antitrust Division of the DOJ and the Swiss Competition Commission (WEKO), in connection with potential antitrust or competition law violations related to certain rates. However, UBS has not reached a final settlement with WEKO, as the Secretariat of WEKO has asserted that UBS does not qualify for full immunity.

LIBOR and other benchmark-related civil litigation: A number of putative class actions and other actions are pending in the federal courts in New York against UBS and numerous other banks on behalf of parties who transacted in certain interest rate benchmark-based derivatives. Also pending in the US and in other jurisdictions are a number of other actions asserting losses related to various products whose interest rates were linked to LIBOR and other benchmarks, including adjustable rate mortgages, preferred and debt securities, bonds pledged as collateral, loans, depository accounts, investments and other interest-bearing instruments. The complaints allege manipulation, through various means, of certain benchmark interest rates, including USD LIBOR, Euroyen TIBOR, Yen LIBOR, EURIBOR, CHF LIBOR, GBP LIBOR, SGD SIBOR and SOR and Australian BBSW, and seek unspecified compensatory and other damages under varying legal theories.

USD LIBOR class and individual actions in the US: In 2013 and 2015, the district court in the USD LIBOR actions dismissed, in whole or in part, certain plaintiffs' antitrust claims, federal racketeering claims, CEA claims, and state common law claims. Although the Second Circuit vacated the district court's judgment dismissing antitrust claims, the district court again dismissed antitrust claims against UBS in 2016. Certain plaintiffs have appealed that decision to the Second Circuit. Separately, in 2018, the Second Circuit reversed in part the district court's 2015 decision dismissing certain individual plaintiffs' claims and certain of these actions are now proceeding. UBS entered into an agreement in 2016 with representatives of a class of bondholders to settle their USD LIBOR class action. The agreement has received preliminary court approval and remains subject to final approval. In 2018, the district court denied plaintiffs' motions for class certification in the USD class actions for claims pending against UBS, and plaintiffs sought permission to appeal that ruling to the Second Circuit. In July 2018, the Second Circuit denied the petition to appeal of the class of USD lenders and in November 2018 denied the petition of the USD exchange class. In December 2019, UBS entered into an agreement with representatives of the class of USD lenders to settle their USD LIBOR class action. The agreement has received preliminary court approval and remains subject to final approval. In January 2019, a putative class action was filed in the District Court for the Southern District of New York against UBS and numerous other banks on behalf of US residents who, since 1 February 2014, directly transacted with a defendant bank in USD LIBOR instruments. The complaint asserts antitrust claims. The defendants moved to dismiss the complaint in August 2019.

Other benchmark class actions in the US: In 2014, the court in one of the Euroyen TIBOR lawsuits dismissed certain of the plaintiffs' claims, including a federal antitrust claim, for lack of standing. In 2015, this court dismissed the plaintiffs' federal racketeering claims on the same basis and affirmed its previous dismissal of the plaintiffs' antitrust claims against UBS. In 2017, this court also dismissed the other Yen LIBOR / Euroyen TIBOR action in its entirety on standing grounds, as did the court in the CHF LIBOR action. Also in 2017, the court in the EURIBOR lawsuit dismissed the case as to UBS and certain other foreign defendants for lack of personal jurisdiction. Plaintiffs in the other Yen LIBOR, Euroyen TIBOR and the EURIBOR actions have appealed the dismissals. In October 2018, the court in the SIBOR / SOR action dismissed all but one of plaintiffs' claims against UBS. Plaintiffs in the CHF LIBOR and SIBOR / SOR actions filed amended complaints following the dismissals, and the courts granted renewed motions to dismiss in July 2019 (SIBOR / SOR) and in September 2019 (CHF LIBOR). Plaintiffs in both actions have appealed. In November 2018, the court in the BBSW lawsuit dismissed the case as to UBS and certain other foreign defendants for lack of personal jurisdiction. Following that dismissal, plaintiffs in the BBSW action filed an amended complaint in April 2019, which UBS and other defendants named in the amended complaint have moved to dismiss. In February 2020, the court in the BBSW action granted in part and denied in part defendants' motions to dismiss the amended complaint. The court dismissed the GBP LIBOR action in August 2019, and plaintiffs appealed the dismissal in September 2019.

Government bonds: Putative class actions have been filed since 2015 in US federal courts against UBS and other banks on behalf of persons who participated in markets for US Treasury securities since 2007. A consolidated complaint was filed in 2017 in the US District Court for the Southern District of New York alleging that the banks colluded with respect to, and manipulated prices of, US Treasury securities sold at auction and in the secondary market and asserting claims under the antitrust laws and for unjust enrichment. Defendants' motions to dismiss the consolidated complaint are pending. Similar class actions have been filed concerning European government bonds and other government bonds.

UBS and reportedly other banks are responding to investigations and requests for information from various authorities regarding government bond trading practices. As a result of its review to date, UBS has taken appropriate action.

Government sponsored entities (GSE) bonds: Starting in February 2019, class action complaints were filed in the US District Court for the Southern District of New York against UBS and other banks on behalf of plaintiffs who traded GSE bonds. A consolidated complaint was filed alleging collusion in GSE bond trading between 1 January 2009 and 1 January 2016. In December 2019, UBS and eleven other defendants agreed to settle the class action for a total of USD 250 million. The settlement is subject to court approval.

Note 21 Provisions and contingent liabilities (continued)

With respect to additional matters and jurisdictions not encompassed by the settlements and orders referred to above, our balance sheet at 31 December 2019 reflected a provision in an amount that UBS believes to be appropriate under the applicable accounting standard. As in the case of other matters for which we have established provisions, the future outflow of resources in respect of such matters cannot be determined with certainty based on currently available information and accordingly may ultimately prove to be substantially greater (or may be less) than the provision that we have recognized.

6. Swiss retrocessions

The Federal Supreme Court of Switzerland ruled in 2012, in a test case against UBS, that distribution fees paid to a firm for distributing third-party and intra-group investment funds and structured products must be disclosed and surrendered to clients who have entered into a discretionary mandate agreement with the firm, absent a valid waiver.

FINMA has issued a supervisory note to all Swiss banks in response to the Supreme Court decision. UBS has met the FINMA requirements and has notified all potentially affected clients.

The Supreme Court decision has resulted, and may continue to result, in a number of client requests for UBS to disclose and potentially surrender retrocessions. Client requests are assessed on a case-by-case basis. Considerations taken into account when assessing these cases include, among other things, the existence of a discretionary mandate and whether or not the client documentation contained a valid waiver with respect to distribution fees.

Our balance sheet at 31 December 2019 reflected a provision with respect to matters described in this item 6 in an amount that UBS believes to be appropriate under the applicable accounting standard. The ultimate exposure will depend on client requests and the resolution thereof, factors that are difficult to predict and assess. Hence, as in the case of other matters for which we have established provisions, the future outflow of resources in respect of such matters cannot be determined with certainty based on currently available information and accordingly may ultimately prove to be substantially greater (or may be less) than the provision that we have recognized.

7. Securities transaction pricing and disclosure

UBS identified and reported to the relevant authorities instances in which some Global Wealth Management clients booked in Hong Kong and Singapore may have been charged inappropriate spreads on debt securities transactions between 2008 and 2015. In November 2019, UBS AG entered into a settlement with the Hong Kong Securities and Futures Commission (SFC) under which it was reprimanded and fined HKD 400 million (USD 51 million) and a settlement with the Monetary Authority of Singapore (MAS) under which it was fined SGD 11 million (USD 8.3 million). In addition, UBS has commenced reimbursing affected customers an aggregate amount equivalent to USD 47 million, including interest.

Our balance sheet at 31 December 2019 reflected a provision with respect to the matter described in this item 7 in an amount that UBS believes to be appropriate under the applicable accounting standard.

Note 22 Other liabilities

a) Other financial liabilities measured at amortized cost

USD million	31.12.19	31.12.18
Other accrued expenses	1,697	1,911
Accrued interest expenses	1,596	1,501
Settlement and clearing accounts	1,368	1,477
Lease liabilities[1]	3,858	
Other	1,854	2,688
Total other financial liabilities measured at amortized cost	10,373	7,576

1 Relates to the adoption of IFRS 16 on 1 January 2019. Refer to Note 1 for more information.

b) Other financial liabilities designated at fair value

USD million	31.12.19	31.12.18
Financial liabilities related to unit-linked investment contracts	28,145	21,679
Securities financing transactions	5,742	9,461
Over-the-counter debt instruments	2,022	2,450
of which: life-to-date own credit (gain) / loss	*(4)*	*(51)*
Funding from UBS Group AG and its subsidiaries	217	
Other	31	5
Total other financial liabilities designated at fair value[1]	36,157	33,594

1 As of 31 December 2019 and 31 December 2018, the contractual redemption amount at maturity of other financial liabilities designated at fair value through profit or loss was not materially different from the carrying amount.

c) Other non-financial liabilities

USD million	31.12.19	31.12.18
Compensation-related liabilities	4,296	4,645
of which: financial advisor compensation plans	*1,459*	*1,454*
of which: other compensation plans	*1,750*	*1,929*
of which: net defined benefit pension and post-employment liabilities	*629*	*773*
of which: other compensation-related liabilities [1]	*458*	*490*
Current and deferred tax liabilities	1,091	915
VAT and other tax payables	445	403
Deferred income	134	215
Other	202	98
Total other non-financial liabilities	6,168	6,275

1 Includes liabilities for payroll taxes and untaken vacation.

Additional information

Note 23 Expected credit loss measurement

a) Expected credit losses in the period

Total net credit loss expenses were USD 78 million in 2019, reflecting net credit loss expenses of USD 100 million related to credit-impaired (stage 3) positions, partly offset by USD 22 million of net releases in expected credit loss expense allowances from stage 1 and 2 positions.

In the Investment Bank, increased stage 1 and 2 ECL allowances and provisions recognized over the year primarily related to loans and credit facilities originated during 2019 and to changes in credit quality of existing assets, partly offset by a change in the applied credit risk models. In Personal & Corporate Banking and Global Wealth Management, ECL allowances and provisions slightly decreased over the year, primarily attributable to a minor improvement in book quality following continued positive developments of selected economic input data.

Stage 3 net losses of USD 100 million were recognized across a number of defaulted positions, mainly in Personal & Corporate Banking (USD 44 million) and, to a lesser extent, in the Investment Bank (USD 26 million) and Global Wealth Management (USD 23 million).

b) Changes to ECL models, scenarios, scenario weights and key inputs

Refer to Note 1a for information about the principles governing ECL models, scenarios, scenario weights and key inputs applied. In addition to the quarterly updates of market and behavioral data, which are relevant input factors to the credit rating methodology and the estimation of the probability of default (PD) and the loss given default (LGD), one significant change was applied to the models used to calculate ECLs for large corporate clients in the Investment Bank. During 2019, the data set was refreshed and aligned with the process applied to regulatory stress testing in the US, which resulted in a net release in expected credit loss expense allowances and provisions from stage 1 and 2 positions of USD 20 million. For portfolios where internal default data is insufficient for modeling purposes, UBS AG relies on external data providers.

Four scenarios and the related macroeconomic factors were reviewed in the fourth quarter of 2019 in light of the economic and political conditions prevailing at year-end. The selection of the three hypothetical scenarios remained essentially unchanged, although the narrative of the severe downside scenario was updated to include additional risks. The key aspects of the narrative for the scenarios are summarized below.

– The baseline scenario assumes continued growth in all key markets, albeit at a slower rate than in 2019. As a consequence, unemployment rates are not expected to fall noticeably, except in the US. Interest rates remain at low levels in line with the central bank policies pursued in the eurozone, Switzerland and in the US.
– The upside scenario assumes continued accommodative central bank policies in developed economies and a gradual decline of geopolitical and economic uncertainty. Underlying macroeconomic conditions improve, and asset values increase substantially.
– The mild downside scenario is based on a monetary policy tightening assumption, implemented by major central banks to deflate a potential asset price bubble, thus causing a mild recession.
– The narrative for the severe downside scenario, which during 2019 focused primarily on developments in the eurozone, has been broadened to cover a severe recessionary phase affecting all major economies. A wide-ranging slowdown is mainly caused by global trade tensions and debt sustainability concerns in Europe. Trade and business confidence are affected, being particularly felt in the key export markets for Swiss industry.

In each quarter the bases to which scenario-specific forecasts are applied, and the baseline forecast itself, were updated using the most recently available information (key macroeconomic data and relevant market indicators). The key forward-looking macroeconomic variables applied to the four scenarios as of 31 December 2019 are summarized in the table on the following page.

The determination of scenario weights is subject to the process and governance outlined in Note 1a item 3g. An econometric model is used to provide input into the scenario weight assessment process. The model output gives a first estimate of the probability that the GDP assumptions used for each scenario materialize, according to the historically observed deviations of GDP growth from trend growth. Since the probability estimates produced by the model do not include an assessment of the underlying economic or political causes, management positions the model output into the context of current conditions and future expectations, and applies judgment in determining the final scenario weights. The reviews during 2019 reflected the increasing probability of a weakening economy in key markets, after a long spell of substantial expansion, and the uncertainties about the influence that several political developments with unforeseeable outcomes may have on future growth. At year-end 2019, management reflected these developments by giving more weight to the severe downside scenario compared with 31 December 2018.

Non-linearity of credit losses in relation to macroeconomic factors is usually most pronounced in portfolios that are most sensitive to interest rates, especially in the areas of mortgage loans to private clients and real estate financing. The mild downside scenario therefore reflects a significant rise in interest rates as a key component and is also particularly relevant for credit risk management purposes.

As noted above, scenario weights are a reflection of risks identified during management's assessment of economic and geopolitical risks and not a specific expectation that a particular narrative with its defined macroeconomic factors (e.g., interest rates) will materialize. Other scenarios for a mild downside with less focus on interest rates would, however, not have been representative of the potential asymmetry of loan losses in a downturn. A more severe recession can be triggered by political factors that cannot be modeled based on observed history; given this consideration, the weight assigned to the severe downside case was also based on management's assessment of the geopolitical risks that might affect all of our key markets and portfolios.

ECL scenario	Assigned weights in %	
	31.12.19	31.12.18
Upside	7.5	10.0
Baseline	42.5	45.0
Mild downside	35.0	35.0
Severe downside	15.0	10.0

Note 23 Expected credit loss measurement (continued)

	One year				Three years cumulative			
Key parameters	Upside	Baseline	Mild downside	Severe downside	Upside	Baseline	Mild downside	Severe downside
Real GDP growth (% change)								
United States	4.3	1.9	(0.5)	(6.4)	10.9	6.4	0.0	(4.3)
Eurozone	3.6	1.0	(0.3)	(9.1)	9.5	2.8	0.7	(10.8)
Switzerland	4.2	1.5	(0.8)	(7.0)	10.4	4.8	(0.1)	(6.2)
Consumer price index (% change)								
United States	3.1	1.8	4.9	(1.2)	8.6	6.2	11.1	0.4
Eurozone	2.1	1.3	2.8	(1.3)	6.7	4.3	6.2	(1.7)
Switzerland	1.5	0.8	1.8	(1.8)	5.5	2.7	4.2	(1.6)
Unemployment rate (change, percentage points)								
United States	(0.9)	(0.4)	0.3	5.7	(0.9)	(0.5)	0.7	5.6
Eurozone	(1.4)	(0.1)	0.6	5.6	(1.9)	(0.2)	1.0	7.9
Switzerland	(0.3)	0.1	0.5	2.6	(0.8)	0.3	1.2	3.6
Fixed income: 10-year government bonds (change in yields, basis points)								
USD	61.0	0.2	187.5	(100.0)	274.1	10.1	262.5	(75.0)
EUR	65.0	8.4	112.5	(30.0)	221.7	28.2	225.0	(20.0)
CHF	73.0	9.5	187.5	(70.0)	283.0	30.0	262.5	(35.0)
Equity indices (% change)								
S&P 500	14.8	3.5	(20.3)	(53.0)	42.7	9.5	(23.5)	(42.9)
EuroStoxx 50	17.0	0.5	(15.5)	(60.0)	44.3	4.4	(14.7)	(52.9)
SPI	13.9	1.4	(19.0)	(56.2)	42.2	5.3	(24.0)	(46.8)
Swiss real estate (% change)								
Single-Family Homes	4.5	0.1	(7.3)	(15.2)	14.1	2.3	(15.8)	(27.0)
Other real estate (% change)								
United States (S&P/Case-Shiller)	6.2	4.0	(4.0)	(13.3)	17.7	16.7	(11.9)	(23.4)
Eurozone (House Price Index)	4.9	1.2	(1.2)	(23.0)	15.4	2.2	(6.8)	(33.2)

c) Development of ECL allowances and provisions

The ECL allowances and provisions recognized in the period are impacted by a variety of factors, such as:
- origination of new instruments during the period;
- effect of passage of time as the ECLs on an instrument for the remaining lifetime reduces (all other factors remaining the same);
- discount unwind within ECLs as it is measured on a present value basis;
- derecognition of instruments in the period;
- change in individual asset quality of instruments;
- portfolio effect of updating forward-looking scenarios and the respective weights;
- movements from a "maximum 12-month ECL" to the recognition of "lifetime ECLs" (and vice versa) following transfers between stages 1 and 2;
- movements from stages 1 and 2 to stage 3 (credit-impaired status) when default has become certain and probability of default (PD) increases to 100% (or vice versa);
- changes in credit risk and/or economic forecasting models or updates to model parameters; and
- foreign exchange translations for assets denominated in foreign currencies and other movements.

Note 23 Expected credit loss measurement (continued)

The following table explains the changes in the ECL allowances and provisions for on- and off-balance sheet financial instruments and other credit lines in scope of ECL requirements between the beginning and the end of the period due to the factors listed on the previous page.

	Development of ECL allowances and provisions			
USD million	Total	Stage 1	Stage 2	Stage 3
Balance as of 31 December 2018	(1,054)	(176)	(183)	(695)
ECL movements due to stage transfer[1]	0	(96)	103	(8)
Net movement from new and derecognized transactions[2]	(53)	(66)	10	3
of which: Private clients with mortgages	*(1)*	*(4)*	*3*	*0*
of which: Real estate financing	*(3)*	*(5)*	*2*	*0*
of which: Large corporate clients	*(6)*	*(14)*	*8*	*0*
of which: SME clients	*(16)*	*(14)*	*(2)*	*0*
Book quality movements	(52)	141	(97)	(96)
Remeasurements due to stage transfers[3]	(125)	110	(138)	(97)
of which: Private clients with mortgages	*(5)*	*70*	*(74)*	*(1)*
of which: Real estate financing	*5*	*21*	*(16)*	*0*
of which: Large corporate clients	*(45)*	*1*	*(11)*	*(35)*
of which: SME clients	*(64)*	*6*	*(17)*	*(53)*
Remeasurements without stage transfers[4]	73	31	41	1
of which: Private clients with mortgages	*22*	*2*	*30*	*(9)*
of which: Real estate financing	*1*	*0*	*0*	*1*
of which: Large corporate clients	*(24)*	*(10)*	*0*	*(14)*
of which: SME clients	*35*	*9*	*10*	*17*
Model and methodology changes[5]	26	17	9	0
Total ECL movements with profit or loss impact[6]	(78)	(4)	25	(100)
Other allowance and provision movements	105	(1)	(2)	108
Write-offs / recoveries[7]	130	0	0	130
Reclassifications[8]	0	0	0	0
Foreign exchange movements[9]	(8)	(1)	(2)	(4)
Other	(19)	0	0	(18)
Balance as of 31 December 2019	(1,029)	(181)	(160)	(688)

1 Represents ECL allowances and provisions prior to ECL remeasurement due to stage transfer. 2 Represents the increase and decrease in allowances and provisions resulting from financial instruments (including guarantees and facilities) that were newly originated, purchased or renewed and from the final derecognition of loans or facilities on their maturity date or earlier. 3 Represents the remeasurement between 12-month and lifetime ECL due to stage transfers. 4 Represents the change in allowances and provisions related to changes in model inputs or assumptions, including changes in forward-looking macroeconomic conditions, changes in the exposure profile, PD and LGD changes, and unwinding of the time value. 5 Represents the change in the allowances and provisions related to changes in models and methodologies. Refer to Note 23b for more information. 6 Includes ECL movements due to stage transfers, ECL movements from new and derecognized transactions, book quality changes and model and methodology changes. 7 Represents the decrease in allowances and provisions resulting from write-offs of the ECL allowance against the gross carrying amount when all or part of a financial asset is deemed uncollectible or forgiven. 8 Represents reclassifications to Other assets measured at amortized cost. 9 Represents the change in allowances and provisions related to movements in foreign exchange rates.

Note 23 Expected credit loss measurement (continued)

The following table explains the changes in the ECL allowances and provisions for *Loans and advances to customers, Loans to financial advisors* and off-balance sheet financial instruments and other credit lines between the beginning and the end of the period.

	Development of ECL allowances and provisions			
USD million	Total	Stage 1	Stage 2	Stage 3
Balance as of 1 January 2018	**(1,117)**	**(141)**	**(193)**	**(783)**
ECL movements due to stage transfer[1]	**0**	**(97)**	**95**	**2**
Net movement from new and derecognized transactions[2]	**(10)**	**(44)**	**15**	**19**
of which: Private clients with mortgages	*(3)*	*(6)*	*4*	*0*
of which: Real estate financing	*(3)*	*(8)*	*5*	*0*
of which: Large corporate clients	*2*	*(6)*	*1*	*8*
of which: SME clients	*(10)*	*(14)*	*4*	*0*
Book quality movements	**(89)**	**112**	**(87)**	**(114)**
Remeasurements due to stage transfers[3]	**(16)**	**95**	**(103)**	**(7)**
of which: Private clients with mortgages	*(11)*	*54*	*(63)*	*(1)*
of which: Real estate financing	*5*	*24*	*(19)*	*0*
of which: Large corporate clients	*(1)*	*0*	*(3)*	*1*
of which: SME clients	*1*	*7*	*(7)*	*0*
Remeasurements without stage transfers[4]	**(73)**	**17**	**16**	**(106)**
of which: Private clients with mortgages	*(9)*	*2*	*(3)*	*(7)*
of which: Real estate financing	*8*	*4*	*12*	*(8)*
of which: Large corporate clients	*(56)*	*(2)*	*(6)*	*(48)*
of which: SME clients	*(55)*	*9*	*6*	*(70)*
Model and methodology changes[5]	**(13)**	**(2)**	**(11)**	**0**
Subtotal ECL movements with profit or loss impact[6]	**(104)**	**(30)**	**11**	**(86)**
Other allowance and provision movements	**227**	**10**	**1**	**216**
Write-offs / recoveries[7]	200	1	0	199
Reclassifications[8]	25	7	3	15
Foreign exchange movements[9]	8	0	0	8
Other	(6)	2	(1)	(6)
Balance as of 31 December 2018	**(1,002)**	**(162)**	**(180)**	**(661)**

1 Represents ECL allowances and provisions prior to ECL remeasurement due to stage transfer. 2 Represents the increase and decrease in allowances and provisions resulting from financial instruments (including guarantees and facilities) that were newly originated, purchased or renewed and from the final derecognition of loans or facilities on their maturity date or earlier. 3 Represents the remeasurement between 12-month and lifetime ECL due to stage transfers. 4 Represents the change in allowances and provisions related to changes in model inputs or assumptions, including changes in forward-looking macroeconomic conditions, changes in the exposure profile, PD and LGD changes, and unwinding of the time value. 5 Represents the change in the allowances and provisions related to changes in models and methodologies. 6 UBS has restated ECL movements with profit or loss (P&L) impact to include ECL movements due to stage transfer. This aligns with a change in approach adopted in 2019 to allow for the total ECL P&L impacts by stage to be disclosed, including ECL movements due to stage transfers, ECL movements from new and derecognized transactions, book quality changes, model and methodology changes and foreign exchange rates. 7 Represents the decrease in allowances and provisions resulting from write-offs of the ECL allowance against the gross carrying amount when all or part of a financial asset is deemed uncollectible or forgiven. 8 Represents reclassifications to Other assets measured at amortized cost. 9 Represents the change in allowances and provisions related to movements in foreign exchange rates.

Note 23 Expected credit loss measurement (continued)

d) Maximum exposure to credit risk

The tables on the following pages provide UBS AG's maximum exposure to credit risk for financial instruments subject to ECL requirements and the respective collateral and other credit enhancements mitigating credit risk for these classes of financial instruments.

The maximum exposure to credit risk includes the carrying amounts of financial instruments recognized on the balance sheet subject to credit risk and the notional amounts for off-balance sheet arrangements. Where information is available, collateral is presented at fair value. For other collateral, such as real estate, a reasonable alternative value is used. Credit enhancements, such as credit derivative contracts and guarantees, are included at their notional amounts. Both are capped at the maximum exposure to credit risk for which they serve as security. The "Risk management and control" section of this report describes management's view of credit risk and the related exposures, which can differ in certain respects from the requirements of IFRS.

Maximum exposure to credit risk

	31.12.19								
		Collateral				Credit enhancements			
USD billion	Maximum exposure to credit risk	Cash collateral received	Collateralized by securities	Secured by real estate	Other collateral[1]	Netting	Credit derivative contracts	Guarantees	Exposure to credit risk after collateral and credit enhancements
Financial assets measured at amortized cost on the balance sheet									
Cash and balances at central banks	107.1								107.1
Loans and advances to banks[2]	12.4		0.0						12.3
Receivables from securities financing transactions	84.2		77.6		5.8				0.8
Cash collateral receivables on derivative instruments[3,4]	23.3					14.4			8.9
Loans and advances to customers[5]	328.0	19.4	101.4	174.7	17.1			1.1	14.3
Other financial assets measured at amortized cost	23.0	0.1	0.4	0.0	1.3				21.2
Total financial assets measured at amortized cost	578.0	19.5	179.4	174.7	24.3	14.4	0.0	1.1	164.6
Financial assets measured at fair value through other comprehensive income – debt	6.3								6.3
Total maximum exposure to credit risk reflected on the balance sheet in scope of ECL	584.3	19.5	179.4	174.7	24.3	14.4	0.0	1.1	171.0
Guarantees[6]	18.1	1.0	3.0	0.1	1.7			2.5	9.8
Loan commitments[6]	27.5	0.2	1.9	1.3	5.8		0.2	0.2	18.0
Forward starting transactions, reverse repurchase and securities borrowing agreements	1.7		1.7						0.0
Committed unconditionally revocable credit lines	36.9	0.3	8.3	4.9	3.6			0.0	19.8
Total maximum exposure to credit risk not reflected on the balance sheet, in scope of ECL	84.2	1.5	14.9	6.3	11.0	0.0	0.2	2.8	47.6

Note 23 Expected credit loss measurement (continued)

Maximum exposure to credit risk (continued)

	31.12.18								
		Collateral				Credit enhancements			Exposure to credit risk after collateral and credit enhancements
USD billion	Maximum exposure to credit risk	Cash collateral received	Collateralized by securities	Secured by real estate	Other collateral[1]	Netting	Credit derivative contracts	Guarantees	
Financial assets measured at amortized cost on the balance sheet									
Cash and balances at central banks	108.4								108.4
Loans and advances to banks[2]	16.6		0.1						16.6
Receivables from securities financing transactions	95.3		92.5		2.5				0.3
Cash collateral receivables on derivative instruments[3,4]	23.6					14.5			9.1
Loans and advances to customers[5]	321.5	17.7	104.4	167.1	16.2		0.0	1.2	14.8
Other financial assets measured at amortized cost	22.6	0.1	0.4	0.0	1.1				21.0
Total financial assets measured at amortized cost	**588.1**	**17.8**	**197.4**	**167.2**	**19.9**	**14.5**	**0.0**	**1.2**	**170.2**
Financial assets measured at fair value through other comprehensive income – debt	**6.7**								**6.7**
Total maximum exposure to credit risk reflected on the balance sheet in scope of ECL	**594.8**	**17.8**	**197.4**	**167.2**	**19.9**	**14.5**	**0.0**	**1.2**	**176.9**
Guarantees[6]	18.1	1.3	2.5	0.1	1.2			2.7	10.2
Loan commitments[6]	31.2	0.4	2.8	1.5	5.7		0.2	0.7	19.8
Forward starting transactions, reverse repurchase and securities borrowing agreements	0.9		0.9						0.0
Committed unconditionally revocable credit lines	38.8	1.1	6.5	4.2	3.9				23.2
Total maximum exposure to credit risk not reflected on the balance sheet, in scope of ECL	**89.0**	**2.8**	**12.7**	**5.8**	**10.8**	**0.0**	**0.2**	**3.4**	**53.2**

1 Includes but is not limited to life insurance contracts, inventory, mortgage loans, gold and other commodities. 2 Loans and advances to banks include amounts held with third-party banks on behalf of clients. The credit risk associated with these balances may be borne by those clients. 3 Included within Cash collateral receivables on derivative instruments are margin balances due from exchanges or clearing houses. Some of these margin balances reflect amounts transferred on behalf of clients who retain the associated credit risk. 4 The amount shown in the "Netting" column represents the netting potential not recognized on the balance sheet. Refer to Note 25 for more information. 5 Collateral arrangements generally incorporate a range of collateral, including cash, securities, property and other collateral. 6 The amount shown in the "Guarantees" column largely relates to sub-participations. Refer to Note 34 for more information.

Note 23 Expected credit loss measurement (continued)

e) Financial assets subject to credit risk by rating category

The table below shows the credit quality and the maximum exposure to credit risk based on the UBS AG's internal credit rating system and year-end stage classification. With the transition to IFRS 9, the credit risk rating reflects UBS AG's assessment of the probability of default of individual counterparties, prior to substitutions. The amounts presented are gross of impairment allowances.

→ **Refer to the "Risk management and control" section of this report for more details regarding UBS AG's internal grading system**

Financial assets subject to credit risk by rating category

USD million	31.12.19								
Rating category[1]	0–1	2–3	4–5	6–8	9–13	Credit-impaired (defaulted)	Total gross carrying amount	ECL allowances	Net carrying amount (maximum exposure to credit risk)
Financial assets measured at amortized cost									
Cash and balances at central banks	105,195	1,873	0	0	0	0	107,068	0	107,068
of which: stage 1	*105,195*	*1,873*	*0*	*0*	*0*	*0*	*107,068*	*0*	*107,068*
Loans and advances to banks	309	9,764	1,326	687	298	1	12,386	(6)	12,379
of which: stage 1	*309*	*9,764*	*1,326*	*677*	*228*	*0*	*12,303*	*(4)*	*12,299*
of which: stage 2	*0*	*0*	*0*	*10*	*71*	*0*	*81*	*(1)*	*80*
of which: stage 3	*0*	*0*	*0*	*0*	*0*	*1*	*1*	*(1)*	*0*
Receivables from securities financing transactions	21,089	16,889	14,366	28,815	3,088	0	84,246	(2)	84,245
of which: stage 1	*21,089*	*16,889*	*14,366*	*28,815*	*3,088*	*0*	*84,246*	*(2)*	*84,245*
Cash collateral receivables on derivative instruments	4,899	10,553	5,033	2,765	39	0	23,289	0	23,289
of which: stage 1	*4,899*	*10,553*	*5,033*	*2,765*	*39*	*0*	*23,289*	*0*	*23,289*
Loans and advances to customers	1,744	176,189	59,240	70,528	18,748	2,308	328,756	(764)	327,992
of which: stage 1	*1,744*	*175,534*	*56,957*	*62,435*	*14,117*	*0*	*310,787*	*(82)*	*310,705*
of which: stage 2	*0*	*655*	*2,283*	*8,093*	*4,631*	*0*	*15,661*	*(123)*	*15,538*
of which: stage 3	*0*	*0*	*0*	*0*	*0*	*2,308*	*2,308*	*(559)*	*1,749*
Other financial assets measured at amortized cost	13,030	1,592	390	7,158	312	672	23,154	(143)	23,012
of which: stage 1	*13,030*	*1,581*	*381*	*6,747*	*280*	*0*	*22,019*	*(35)*	*21,985*
of which: stage 2	*0*	*11*	*9*	*412*	*32*	*0*	*463*	*(13)*	*451*
of which: stage 3	*0*	*0*	*0*	*0*	*0*	*672*	*672*	*(95)*	*576*
Total financial assets measured at amortized cost	146,267	216,860	80,354	109,952	22,485	2,981	578,899	(915)	577,985
On-balance sheet financial instruments									
Financial assets measured at FVOCI – debt instruments	5,854	450	0	41	0	0	6,345	0	6,345
Total on balance sheet financial instruments	152,120	217,309	80,354	109,994	22,485	2,981	585,245	(915)	584,329

1 Refer to the "Internal UBS rating scale and mapping of external ratings" table in the "Risk management and control" section of this report for more information on rating categories.

Note 23 Expected credit loss measurement (continued)

Off-balance sheet positions subject to expected credit loss by rating category

USD million	31.12.19							
Rating category[1]	0–1	2–3	4–5	6–8	9–13	Credit-impaired (defaulted)	Total carrying amount (maximum exposure to credit risk)	ECL provision
Off-balance sheet financial instruments								
Guarantees	857	4,932	6,060	5,450	761	82	18,142	(42)
of which: stage 1	*857*	*4,931*	*6,048*	*5,218*	*704*	*0*	*17,757*	*(8)*
of which: stage 2	*0*	*1*	*12*	*233*	*57*	*0*	*304*	*(1)*
of which: stage 3	*0*	*0*	*0*	*0*	*0*	*82*	*82*	*(33)*
Irrevocable loan commitments	2,548	10,068	4,862	5,859	4,160	50	27,547	(35)
of which: stage 1	*2,548*	*10,068*	*4,862*	*5,722*	*3,878*	*0*	*27,078*	*(30)*
of which: stage 2	*0*	*0*	*0*	*137*	*282*	*0*	*419*	*(5)*
of which: stage 3	*0*	*0*	*0*	*0*	*0*	*50*	*50*	*0*
Forward starting reverse repurchase and securities borrowing agreements	0	672	50	936	0	0	1,657	0
Total off balance sheet financial instruments	3,405	15,672	10,972	12,245	4,922	132	47,347	(77)
Other credit lines								
Committed unconditionally revocable credit lines	632	14,346	6,231	7,169	8,554	46	36,979	(34)
of which: stage 1	*632*	*14,309*	*6,120*	*6,789*	*7,889*	*0*	*35,740*	*(17)*
of which: stage 2	*0*	*37*	*111*	*380*	*665*	*0*	*1,193*	*(17)*
of which: stage 3	*0*	*0*	*0*	*0*	*0*	*46*	*46*	*0*
Irrevocable committed prolongation of existing loans	25	1,399	870	633	359	4	3,289	(3)
of which: stage 1	*25*	*1,399*	*870*	*633*	*359*	*0*	*3,285*	*(3)*
of which: stage 2	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
of which: stage 3	*0*	*0*	*0*	*0*	*0*	*4*	*4*	*0*
Total other credit lines	657	15,745	7,101	7,801	8,913	50	40,268	(37)

1 Refer to the "Internal UBS rating scale and mapping of external ratings" table in the "Risk management and control" section of this report for more information on rating categories.

Note 23 Expected credit loss measurement (continued)

Financial assets subject to credit risk by rating category

USD million	31.12.18								
Rating category[1]	0–1	2–3	4–5	6–8	9–13	Credit-impaired (defaulted)	Total gross carrying amount	ECL allowances	Net carrying amount (maximum exposure to credit risk)
Financial assets measured at amortized cost									
Cash and balances at central banks	**103,635**	**4,735**	**0**	**0**	**0**	**0**	**108,370**	**0**	**108,370**
of which: stage 1	*103,635*	*4,735*	*0*	*0*	*0*	*0*	*108,370*	*0*	*108,370*
Loans and advances to banks	**829**	**13,286**	**1,302**	**922**	**307**	**3**	**16,649**	**(8)**	**16,641**
of which: stage 1	829	13,286	1,302	758	268	0	16,443	*(4)*	*16,439*
of which: stage 2	0	0	0	164	39	0	203	*(1)*	*202*
of which: stage 3	*0*	*0*	*0*	*0*	*0*	*3*	*3*	*(3)*	*0*
Receivables from securities financing transactions	**29,065**	**24,653**	**13,602**	**26,866**	**1,165**	**0**	**95,351**	**(2)**	**95,349**
of which: stage 1	*29,065*	*24,653*	*13,602*	*26,866*	*1,165*	*0*	*95,351*	*(2)*	*95,349*
Cash collateral receivables on derivative instruments	**5,136**	**10,044**	**5,282**	**3,040**	**101**	**0**	**23,603**	**0**	**23,603**
of which: stage 1	*5,136*	*10,044*	*5,282*	*3,040*	*101*	*0*	*23,603*	*0*	*23,603*
Loans and advances to customers	**3,641**	**173,454**	**52,806**	**74,042**	**16,014**	**2,297**	**322,255**	**(772)**	**321,482**
of which: stage 1	*3,621*	*172,714*	*49,517*	*62,484*	*11,111*	*0*	*299,448*	*(69)*	*299,379*
of which: stage 2	*20*	*740*	*3,289*	*11,558*	*4,903*	*0*	*20,510*	*(155)*	*20,355*
of which: stage 3	*0*	*0*	*0*	*0*	*0*	*2,297*	*2,297*	*(549)*	*1,748*
Other financial assets measured at amortized cost	**13,409**	**682**	**316**	**7,525**	**274**	**586**	**22,792**	**(156)**	**22,636**
of which: stage 1	*13,409*	*682*	*316*	*7,300*	*272*	*0*	*21,979*	*(43)*	*21,936*
of which: stage 2	*0*	*0*	*0*	*225*	*2*	*0*	*227*	*(4)*	*223*
of which: stage 3	*0*	*0*	*0*	*0*	*0*	*586*	*586*	*(109)*	*477*
Total financial assets measured at amortized cost	**155,715**	**226,854**	**73,308**	**112,395**	**17,861**	**2,886**	**589,020**	**(937)**	**588,081**
On-balance sheet financial instruments									
Financial assets measured at FVOCI – debt instruments	**3,889**	**2,702**	**0**	**76**	**0**	**0**	**6,667**	**0**	**6,667**
Total on balance sheet financial instruments	**159,604**	**229,556**	**73,308**	**112,471**	**17,861**	**2,886**	**595,687**	**(937)**	**594,748**

1 Refer to the "Internal UBS rating scale and mapping of external ratings" table in the "Risk management and control" section of this report for more information on rating categories.

Note 23 Expected credit loss measurement (continued)

Off-balance sheet positions subject to expected credit loss by rating category

USD million	31.12.18							
Rating category[1]	0–1	2–3	4–5	6–8	9–13	Credit-impaired (defaulted)	Total carrying amount (maximum exposure to credit risk)	ECL provision
Off-balance sheet financial instruments								
Guarantees	978	6,673	3,859	5,415	1,006	215	18,146	(43)
of which: stage 1	*978*	*6,670*	*3,849*	*5,013*	*811*		*17,321*	*(7)*
of which: stage 2		*3*	*10*	*402*	*195*	*0*	*610*	*(2)*
of which: stage 3	*0*	*0*	*0*	*0*		*215*	*215*	*(34)*
Irrevocable loan commitments	2,088	11,667	6,519	6,480	4,405	53	31,212	(37)
of which: stage 1	*2,088*	*11,667*	*6,519*	*6,297*	*4,020*	*0*	*30,591*	*(32)*
of which: stage 2	*0*	*0*	*0*	*183*	*385*	*0*	*568*	*(5)*
of which: stage 3	*0*	*0*	*0*	*0*		*53*	*53*	*0*
Forward starting reverse repurchase and securities borrowing agreements	25	510	150	254	0	0	939	0
Total off balance sheet financial instruments	3,091	18,850	10,528	12,148	5,411	268	50,296	(80)
Other credit lines								
Committed unconditionally revocable credit lines	776	12,426	5,332	12,140	8,084	93	38,851	(35)
of which: stage 1	*768*	*12,398*	*5,202*	*11,367*	*7,603*		*37,338*	*(19)*
of which: stage 2	*8*	*28*	*130*	*773*	*481*	*0*	*1,420*	*(16)*
of which: stage 3	*0*				*0*	*93*	*93*	
Irrevocable committed prolongation of existing loans	27	1,346	889	901	154	22	3,339	(1)
of which: stage 1	*27*	*1,315*	*680*	*701*	*137*	*0*	*2,860*	*(1)*
of which: stage 2	*0*	*31*	*209*	*200*	*17*	*0*	*457*	*0*
of which: stage 3	*0*	*0*	*0*			*22*	*22*	*0*
Total other credit lines	803	13,772	6,221	13,041	8,238	115	42,190	(36)

1 Refer to the "Internal UBS rating scale and mapping of external ratings" table in the "Risk management and control" section of this report for more information on rating categories.

Note 23 Expected credit loss measurement (continued)

f) Credit-impaired financial instruments at amortized cost

The credit risk in UBS AG's portfolio is actively managed by taking collateral against exposures and by utilizing credit hedging. Collateral held against credit-impaired loan exposures (stage 3) mainly consisted of real estate and securities. It is UBS AG's policy to dispose of foreclosed real estate as soon as practicable. The carrying amount of foreclosed property recorded in our balance sheet at the end of 2019 and 2018 amounted to USD 86 million and USD 60 million, respectively. The firm seeks to liquidate collateral held in the form of financial assets expeditiously and at prices considered fair. This may require us to purchase assets for our own account, where permitted by law, pending orderly liquidation. Financial assets that are credit-impaired and related collateral held in order to mitigate potential losses are shown in the table below.

USD million	31.12.19			
	Gross carrying amount	Allowance for expected credit losses	Net carrying amount	Collateral / credit enhancements
Loans and advances to banks	1	(1)	0	0
Loans and advances to customers	2,308	(559)	1,749	1,698
of which: Private clients with mortgages	*1,000*	*(41)*	*959*	*959*
of which: Real estate financing	*21*	*(4)*	*17*	*13*
of which: Large corporate clients	*192*	*(98)*	*94*	*77*
of which: SME clients	*791*	*(271)*	*521*	*461*
of which: Lombard	*116*	*(18)*	*98*	*89*
Other financial assets measured at amortized cost	672	(95)	576	22
Total credit-impaired financial assets measured at amortized cost	**2,981[1]**	**(655)[1]**	**2,326**	**1,720**
Guarantees	82	(33)		10
of which: Large corporate clients	*24*	*(9)*		*8*
of which: SME clients	*58*	*(23)*		*2*
Loan commitments	50	0		12
Committed unconditionally revocable credit lines	46	0		5
Irrevocable committed prolongation of existing loans	4	0		0
Total off-balance sheet financial instruments and other credit lines	**182[1]**	**(33)[1]**		**27**

1 Under IFRS 9, adopted on 1 January 2018, an instrument is classified as credit-impaired if the counterparty is defaulted, and/or the instrument is purchased or originated credit-impaired and includes credit-impaired exposures for which no loss has occurred or no allowance has been recognized (e.g., because they are expected to be fully recoverable through the collateral held).

USD million	31.12.18			
	Gross carrying amount	Allowance for expected credit losses	Net carrying amount	Collateral / credit enhancements
Loans and advances to banks	3	(3)	0	0
Loans and advances to customers	2,297	(549)	1,748	1,654
of which: Private clients with mortgages	*836*	*(39)*	*796*	*796*
of which: Real estate financing	*54*	*(16)*	*38*	*30*
of which: Large corporate clients	*170*	*(82)*	*88*	*79*
of which: SME clients	*888*	*(256)*	*632*	*561*
of which: Lombard	*31*	*(17)*	*14*	*14*
Other financial assets measured at amortized cost	586	(109)	478	12
Total credit-impaired financial assets measured at amortized cost	**2,886[1]**	**(660)[1]**	**2,226**	**1,666**
Guarantees	215	(34)		84
of which: Large corporate clients	*127*	*(6)*		*79*
of which: SME clients	*77*	*(25)*		*5*
Loan commitments	53	0		8
Committed unconditionally revocable credit lines	93	0		9
Irrevocable committed prolongation of existing loans	22	0		0
Total off-balance sheet financial instruments and other credit lines	**383[1]**	**(34)[1]**		**102**

1 Under IFRS 9, adopted on 1 January 2018, an instrument is classified as credit-impaired if the counterparty is defaulted, and/or the instrument is purchased or originated credit-impaired and includes credit-impaired exposures for which no loss has occurred or no allowance has been recognized (e.g., because they are expected to be fully recoverable through the collateral held).

Note 23 Expected credit loss measurement (continued)

g) Sensitivity information

As outlined in Note 1a, ECL estimates involve significant uncertainties at the time they are made.

ECL model

The models applied to determine point in time probability of default (PD) and loss given default (LGD) rely on market and statistical data, which have been found to correlate well with historically observed defaults in sufficiently homogeneous segments. The risk sensitivities for each of the IFRS 9 reporting segments to such factors have been summarized in Note 10.

Emerging new systematic risk factors may not be sufficiently taken into account by existing models and may affect the responsiveness thereof to a changing environment. This risk is deemed to be immaterial and is monitored through regular model review processes. It is deemed to be of less importance in particular for the large books of mortgage loans, where risk drivers tend to be stable.

Statistically derived models, which perform well on a reasonably sized and homogeneous portfolio, may show weakness in smaller-sized sub-portfolios, for which other or differently weighted factors may be more relevant criteria. Where risk experts conclude that the output of a general model is not in line with what they would have expected for a specific portfolio segment, and that this would be material for ECL, the use of overlays would be recommended, based on management judgment.

ECL estimations for segments where the PD is homogeneous, but the credit exposure is not, may prove to be inaccurate – even though all parameters have been accurately predicted – as the actual amount of loss depends on the exposure of the position that defaulted. This observation is less relevant for retail-type portfolios with smaller individual exposures from mortgage loans or financing of small and medium-sized corporate clients (SME), but may become important for the large corporate client portfolios in the Investment Bank and Personal & Corporate Banking.

Forward-looking scenarios

Depending on the scenario selection and related macroeconomic assumptions for the risk factors, the components of the relevant weighted average ECL change. This is particularly relevant for interest rates, which can take both directions under a given growth assumption (for example, low growth with high interest rates in a stagflation scenario, versus low growth and falling interest rates in a recession). Management will look for scenario narratives that reflect the key risk drivers of a credit portfolio.

As forecasting models are complex, due to the combination of multiple factors, simple what-if analyses involving a change of individual parameters do not necessarily provide realistic information on the exposure of segments to changes in the macroeconomy. Portfolio-specific analyses based on their key risk factors would also not be meaningful, as potential compensatory effects in other segments would be ignored. The table below indicates some sensitivities to ECLs if a key macroeconomic variable for the forecasting period is amended across all scenarios with all other factors remaining unchanged.

Potential effect on stage 1 and stage 2 positions from changing key parameters as at 31 December 2019

USD million	Baseline	Upside	Mild downside	Severe downside	Weighted average
Change in key parameters					
Fixed income: 10-year government bonds (absolute change)					
–1.00%	0.34	(0.52)	(25.25)	(0.21)	(7.69)
–0.25%	0.06	(0.31)	(7.72)	(0.11)	(2.31)
+0.25%	(0.02)	0.47	7.75	0.12	2.18
+1.00%	3.34	4.03	36.65	0.11	13.35
Unemployment rate (absolute change)					
–1.00%	(6.72)	(4.79)	(26.41)	(54.97)	(18.02)
–0.25%	(2.00)	(1.45)	(7.79)	(16.20)	(5.43)
+0.25%	2.26	1.65	8.74	17.31	5.99
+1.00%	8.56	5.93	36.27	73.04	24.36
Real GDP growth (relative change)					
–1.00%	2.50	2.42	2.42	1.01	2.19
+1.00%	(2.79)	(1.47)	(2.47)	(1.01)	(2.37)
House Price Index (relative change)					
–5.00%	1.00	0.59	4.67	9.50	3.06
–1.00%	0.21	0.13	0.85	1.89	0.56
+1.00%	(0.16)	(0.09)	(0.90)	(2.16)	(0.54)
+5.00%	(0.25)	(0.42)	(4.66)	(8.51)	(2.52)

Note 23 Expected credit loss measurement (continued)

Sensitivities at the UBS AG level can be more meaningfully assessed in the context of coherent scenarios with consistently developed macroeconomic factors. The table on the previous page outlines favorable and unfavorable effects based on reasonably possible alternative changes to the economic conditions on ECL for stage 1 and stage 2 positions by disclosing for each scenario (see item b in this Note) and material portfolio the corresponding ECL output. The effect of applying scenarios is not linear across the portfolio, with a significant impact observed in the mortgage loan books, as the potential effect of rising interest rates manifests itself in the mild downside scenario, while high unemployment rates combined with a marked correction of house prices contribute to high expected losses in the severe downside scenario.

The forecasting horizon is limited to three years, with a model-based mean reversion of PD and LGD assumed thereafter. Changes to these timelines may have an effect on ECLs: depending on the cycle, a longer or shorter forecasting horizon will lead to different annualized lifetime PD and average LGD estimations. This is currently not deemed to be material for UBS AG, as a large proportion of loans, including mortgages in Switzerland, have maturities that are within the forecasting horizon.

Scenario weights

ECL is sensitive to changing scenario weights, in particular if narratives and parameters are selected that are not close to the baseline scenario, highlighting the non-linearity of credit losses.

As shown in the table on the bottom of this page, the ECL for stage 1 and stage 2 positions would have been USD 234 million (31 December 2018: USD 237 million) instead of USD 341 million (31 December 2018: USD 359 million) if ECL had been determined solely on the baseline scenario. The weighted average ECL therefore amounts to 149% (31 December 2018: 152%) of the baseline value.

Stage allocation and SICR

The determination of what constitutes a significant increase in credit risk (SICR) is based on management judgment as explained in Note 1a. Changing the SICR trigger will have a direct effect on ECLs, as more or fewer positions would be subject to lifetime ECLs under any scenario.

The relevance of the SICR trigger on overall ECL is demonstrated in the table below with the indication that the ECL for stage 1 and stage 2 positions would have been USD 713 million if all non-impaired positions across the portfolio had been measured for lifetime ECLs irrespective of their actual SICR status.

Maturity profile

The maturity profile of the assets is an important driver for changes in ECL due to transfers to stage 2. The current maturity profile of most lending books is relatively short; hence a movement to stage 2 may have a limited effect on ECLs. A significant portion of our lending to SMEs is documented under frame credit agreements, which allow for various forms of utilization but are unconditionally cancelable by UBS AG at any time. The relevant maturity for drawings under such agreements with a fixed maturity is the respective term, or a maximum of 12 months in stage 1. For unused credit lines and all drawings that have no fixed maturity (e.g., current accounts), UBS AG generally applies a 12-month maturity from the reporting date, given the credit review policies, which require either continuous monitoring of key indicators and behavioral patterns for smaller positions or an annual formal review for any other limit. The ECLs for these products is sensitive to shortening or extending the maturity assumption.

Potential effect on stage 1 and stage 2 positions from changing scenario weights or moving to a lifetime ECL calculation as at 31 December 2019

	Actual ECL allowances and provisions (as per Note 10)		Pro forma ECL allowances and provisions, assuming application of 100% weighting								Pro forma ECL allowances and provisions, assuming all positions being subject to lifetime ECL	
Scenarios	Weighted average		Baseline		Upside		Mild downside		Severe downside		Weighted average	
USD million, except where indicated	ECL	in % of baseline	ECL	in % of baseline	ECL	in % of baseline	ECL	in % of baseline	ECL	in % of baseline	ECL	in % of baseline
Segmentation												
Private clients with mortgages	73	248	32	100	27	84	107	336	179	562	191	646
Real estate financing	55	169	35	100	28	81	61	175	128	368	82	251
Large corporate clients	48	151	32	100	28	87	39	120	106	329	95	296
SME clients	51	112	45	100	42	93	55	121	67	147	93	205
Other segments	113	127	90	100	78	87	126	140	166	185	252	283
Total	341	**149**	234	**100**	**203**	**87**	**387**	**166**	**646**	**276**	713	**312**

Note 24 Fair value measurement

This Note provides fair value measurement information for both financial and non-financial instruments and is structured as follows:

a) Valuation principles
b) Valuation governance
c) Fair value hierarchy
d) Valuation adjustments
e) Transfers between Level 1 and Level 2
f) Level 3 instruments: valuation techniques and inputs
g) Level 3 instruments: sensitivity to changes in unobservable input assumptions
h) Level 3 instruments: movements during the period
i) Maximum exposure to credit risk for financial instruments measured at fair value
j) Financial instruments not measured at fair value

a) Valuation principles

Fair value is defined as the price that would be received for the sale of an asset or paid to transfer a liability in an orderly transaction between market participants in the principal market (or most advantageous market, in the absence of a principal market) as of the measurement date. In measuring fair value, UBS uses various valuation approaches and applies a hierarchy for prices and inputs that maximizes the use of observable market data, if available.

All financial and non-financial assets and liabilities measured or disclosed at fair value are categorized into one of three fair value hierarchy levels in accordance with IFRS. The fair value hierarchy is based on the transparency of inputs to the valuation of an asset or liability as of the measurement. In certain cases, the inputs used to measure fair value may fall within different levels of the fair value hierarchy. For disclosure purposes, the level in the hierarchy within which the instrument is classified in its entirety is based on the lowest level input that is significant to the position's fair value measurement:

– Level 1 – quoted prices (unadjusted) in active markets for identical assets and liabilities;
– Level 2 – valuation techniques for which all significant inputs are, or are based on, observable market data; or
– Level 3 – valuation techniques for which significant inputs are not based on observable market data.

Fair values are determined using quoted prices in active markets for identical assets or liabilities, where available. An active market is one in which transactions for the asset or liability take place with sufficient frequency and volume to provide pricing data on an ongoing basis. Assets and liabilities that are quoted and traded in an active market are valued at the currently quoted price multiplied by the number of units of the instrument held.

Where the market for a financial instrument or non-financial asset or liability is not active, fair value is established using a valuation technique, including pricing models. Valuation techniques involve the use of estimates, the extent of which depends on the complexity of the instrument and the availability of market-based data. Valuation adjustments may be made to allow for additional factors, including model, liquidity, credit and funding risks, which are not explicitly captured within the valuation technique, but which would nevertheless be considered by market participants when establishing a price. The limitations inherent in a particular valuation technique are considered in the determination of an asset or liability's classification within the fair value hierarchy.

Many cash instruments and over-the-counter (OTC) derivative contracts have bid and offer prices that can be observed in the marketplace. Bid prices reflect the highest price that a party is willing to pay for an asset. Offer prices represent the lowest price that a party is willing to accept for an asset. In general, long positions are measured at a bid price and short positions at an offer price, reflecting the prices at which the instruments could be transferred under normal market conditions. Offsetting positions in the same financial instrument are marked at the mid-price within the bid–offer spread.

Generally, the unit of account for a financial instrument is the individual instrument, and UBS applies valuation adjustments at an individual instrument level, consistent with that unit of account. However, if certain conditions are met, UBS may estimate the fair value of a portfolio of financial assets and liabilities with substantially similar and offsetting risk exposures on the basis of the net open risks.

For transactions where the valuation technique used to measure fair value requires significant inputs that are not based on observable market data, the financial instrument is initially recognized at the transaction price. This initial recognition amount may differ from the fair value obtained using the valuation technique. Any such difference is deferred and not recognized in the income statement and referred to as deferred day-1 profit or loss.

→ **Refer to Note 24d for more information**

b) Valuation governance

UBS's fair value measurement and model governance framework includes numerous controls and other procedural safeguards that are intended to maximize the quality of fair value measurements reported in the financial statements. New products and valuation techniques must be reviewed and approved by key stakeholders from risk and finance control functions. Responsibility for the ongoing measurement of financial and non-financial instruments at fair value resides with the business divisions. In carrying out their valuation responsibilities, the businesses are required to consider the availability and quality of external market data and to provide justification and rationale for their fair value estimates.

Fair value estimates are validated by risk and finance control functions, which are independent of the business divisions. Independent price verification is performed by Finance through benchmarking the business divisions' fair value estimates with observable market prices and other independent sources. Controls and a governance framework are in place and are intended to ensure the quality of third-party pricing sources where used. For instruments where valuation models are used to determine fair value, independent valuation and model control groups within Finance and Risk Control evaluate UBS's models on a regular basis, including valuation and model input parameters as well as pricing. As a result of the valuation controls employed, valuation adjustments may be made to the business divisions' estimates of fair value to align with independent market data and the relevant accounting standard.

→ **Refer to Note 24d for more information**

Note 24 Fair value measurement (continued)

c) Fair value hierarchy

The table below provides the fair value hierarchy classification of financial and non-financial assets and liabilities measured at fair value. The narrative that follows describes the different product types, valuation techniques used in measuring their fair value, including significant valuation inputs and assumptions used, and the factors determining their classification within the fair value hierarchy.

Determination of fair values from quoted market prices or valuation techniques[1]

	31.12.19				31.12.18			
USD million	Level 1	Level 2	Level 3	Total	Level 1	Level 2	Level 3	Total
Financial assets measured at fair value on a recurring basis								
Financial assets at fair value held for trading	113,635	12,248	1,812	127,695	88,455	14,096	1,962	104,513
of which:								
Equity instruments	*96,162*	*400*	*226*	*96,788*	*72,270*	*455*	*46*	*72,771*
Government bills / bonds	*9,630*	*1,770*	*64*	*11,464*	*9,554*	*1,607*	*0*	*11,161*
Investment fund units	*7,088*	*1,729*	*50*	*8,867*	*6,074*	*3,200*	*442*	*9,716*
Corporate and municipal bonds	*755*	*6,796*	*542*	*8,093*	*558*	*5,699*	*651*	*6,908*
Loans	*0*	*1,180*	*791*	*1,971*	*0*	*2,886*	*680*	*3,566*
Asset-backed securities	*0*	*372*	*140*	*512*	*0*	*248*	*144*	*392*
Derivative financial instruments	356	120,224	1,264	121,843	753	124,035	1,424	126,212
of which:								
Foreign exchange contracts	*240*	*52,228*	*8*	*52,476*	*311*	*53,151*	*30*	*53,492*
Interest rate contracts	*6*	*42,288*	*263*	*42,558*	*0*	*36,658*	*418*	*37,076*
Equity / index contracts	*7*	*22,220*	*597*	*22,825*	*3*	*30,905*	*496*	*31,404*
Credit derivative contracts	*0*	*1,612*	*394*	*2,007*	*0*	*1,444*	*476*	*1,920*
Commodity contracts	*0*	*1,820*	*0*	*1,821*	*0*	*1,768*	*2*	*1,769*
Brokerage receivables	0	18,007	0	18,007	0	16,840	0	16,840
Financial assets at fair value not held for trading	40,608	39,065	3,962	83,636	40,204	37,770	4,413	82,387
of which:								
Financial assets for unit-linked investment contracts[2]	*27,568*	*118*	*0*	*27,686*	*21,440*	*5*	*0*	*21,446*
Corporate and municipal bonds	*653*	*18,732*	*0*	*19,385*	*781*	*16,455*	*0*	*17,236*
Government bills / bonds	*12,089*	*3,700*	*0*	*15,790*	*17,687*	*4,806*	*0*	*22,493*
Loans	*0*	*10,206*	*1,231*	*11,438*	*0*	*6,380*	*1,752*	*8,132*
Securities financing transactions	*0*	*6,148*	*147*	*6,294*	*0*	*9,899*	*39*	*9,937*
Auction rate securities	*0*	*0*	*1,536*	*1,536*	*0*	*0*	*1,664*	*1,664*
Investment fund units	*194*	*140*	*98*	*432*	*173*	*125*	*109*	*407*
Equity instruments	*103*	*4*	*451*	*559*	*123*	*62*	*517*	*702*
Other	*0*	*16*	*499*	*515*	*0*	*38*	*331*	*369*
Financial assets measured at fair value through other comprehensive income on a recurring basis								
Financial assets measured at fair value through other comprehensive income	1,906	4,439	0	6,345	2,319	4,347	0	6,667
of which:								
Asset-backed securities	*0*	*3,955*	*0*	*3,955*	*0*	*3,931*	*0*	*3,931*
Government bills / bonds	*1,859*	*16*	*0*	*1,875*	*2,171*	*69*	*0*	*2,239*
Corporate and municipal bonds	*47*	*468*	*0*	*515*	*149*	*348*	*0*	*497*
Non-financial assets measured at fair value on a recurring basis								
Precious metals and other physical commodities	4,597	0	0	4,597	4,298	0	0	4,298
Non-financial assets measured at fair value on a non-recurring basis								
Other non-financial assets[3]	0	0	199	199	0	82	0	82
Total assets measured at fair value	161,102	193,983	7,237	362,322	136,029	197,170	7,800	340,999

Note 24 Fair value measurement (continued)

Determination of fair values from quoted market prices or valuation techniques (continued)[1]

	31.12.19				31.12.18			
USD million	Level 1	Level 2	Level 3	Total	Level 1	Level 2	Level 3	Total
Financial liabilities measured at fair value on a recurring basis								
Financial liabilities at fair value held for trading	25,791	4,726	75	30,591	24,413	4,468	69	28,949
of which:								
Equity instruments	*22,526*	*149*	*59*	*22,734*	*21,313*	*537*	*42*	*21,892*
Corporate and municipal bonds	*40*	*3,606*	*16*	*3,661*	*126*	*3,377*	*27*	*3,530*
Government bills / bonds	*2,820*	*646*	*0*	*3,466*	*2,423*	*416*	*0*	*2,839*
Investment fund units	*404*	*294*	*0*	*698*	*551*	*137*	*0*	*689*
Derivative financial instruments	385	118,498	1,996	120,880	580	122,933	2,210	125,723
of which:								
Foreign exchange contracts	*248*	*53,705*	*60*	*54,013*	*322*	*52,964*	*86*	*53,372*
Interest rate contracts	*7*	*36,434*	*130*	*36,571*	*7*	*32,511*	*226*	*32,743*
Equity / index contracts	*3*	*24,171*	*1,293*	*25,468*	*1*	*33,669*	*1,371*	*35,041*
Credit derivative contracts	*0*	*2,448*	*512*	*2,960*	*0*	*2,203*	*519*	*2,722*
Commodity contracts	*0*	*1,707*	*0*	*1,707*	*0*	*1,487*	*0*	*1,487*
Financial liabilities designated at fair value on a recurring basis								
Brokerage payables designated at fair value	0	37,233	0	37,233	0	38,420	0	38,420
Debt issued designated at fair value	0	56,943	9,649	66,592	0	46,074	10,957	57,031
Other financial liabilities designated at fair value	0	35,119	1,039	36,157	0	32,569	1,025	33,594
of which:								
Financial liabilities related to unit-linked investment contracts	*0*	*28,145*	*0*	*28,145*	*0*	*21,679*	*0*	*21,679*
Securities financing transactions	*0*	*5,742*	*0*	*5,742*	*0*	*9,461*	*0*	*9,461*
Over-the-counter debt instruments	*0*	*1,231*	*791*	*2,022*	*0*	*1,427*	*1,023*	*2,450*
Total liabilities measured at fair value	**26,176**	**252,518**	**12,759**	**291,452**	**24,992**	**244,465**	**14,260**	**283,717**

1 Bifurcated embedded derivatives are presented on the same balance sheet lines as their host contracts and are not included in this table. The fair value of these derivatives was not material for the periods presented. 2 Fair value hierarchy information for Financial assets for unit-linked investment contracts in the comparative period has been restated, resulting in an increase in Level 1 assets of USD 4,746 million as of 31 December 2018, with a corresponding decrease in Level 2 assets. 3 Other non-financial assets primarily consist of properties and other non-current assets held for sale, which are measured at the lower of their net carrying amount or fair value less costs to sell.

Note 24 Fair value measurement (continued)

Valuation techniques

Valuation techniques are used to value positions for which a market price is not available from active market sources. This includes certain less liquid debt and equity instruments, certain exchange-traded derivatives and all derivatives transacted in the OTC market. UBS uses widely recognized valuation techniques for determining the fair value of financial and non-financial instruments that are not actively traded and quoted. The most frequently applied valuation techniques include discounted value of expected cash flows, relative value and option pricing methodologies.

Discounted value of expected cash flows is a valuation technique that measures fair value using estimated expected future cash flows from assets or liabilities and then discounts these cash flows using a discount rate or discount margin that reflects the credit and/or funding spreads required by the market for instruments with similar risk and liquidity profiles to produce a present value. When using such valuation techniques, expected future cash flows are estimated using an observed or implied market price for the future cash flows or by using industry standard cash flow projection models. The discount factors within the calculation are generated using industry standard yield curve modeling techniques and models.

Relative value models measure fair value based on the market prices of equivalent or comparable assets or liabilities, making adjustments for differences between the characteristics of the observed instrument and the instrument being valued.

Option pricing models incorporate assumptions regarding the behavior of future price movements of an underlying referenced asset or assets to generate a probability-weighted future expected payoff for the option. The resulting probability-weighted expected payoff is then discounted using discount factors generated from industry standard yield curve modeling techniques and models. The option pricing model may be implemented using a closed-form analytical formula or other mathematical techniques (e.g., binomial tree or Monte Carlo simulation).

Where available, valuation techniques use market-observable assumptions and inputs. If such data is not available, inputs may be derived by reference to similar assets in active markets, from recent prices for comparable transactions or from other observable market data. In such cases, the inputs selected are based on historical experience and practice for similar or analogous instruments, derivation of input levels based on similar products with observable price levels and knowledge of current market conditions and valuation approaches.

For more complex instruments, fair values may be estimated using a combination of observed transaction prices, consensus pricing services and relevant quotes. Consideration is given to the nature of the quotes (e.g., indicative or firm) and the relationship of recently evidenced market activity to the prices provided by consensus pricing services. UBS also uses internally developed models, which are typically based on valuation methods and techniques recognized as standard within the industry.

Assumptions and inputs used in valuation techniques include benchmark interest rate curves, credit and funding spreads used in estimating discount rates, bond and equity prices, equity index prices, foreign exchange rates, levels of market volatility and correlation. Refer to Note 24f for more information. The discount curves used by UBS incorporate the funding and credit characteristics of the instruments to which they are applied.

Financial instruments excluding derivatives: product description, valuation and classification in the fair value hierarchy

Government bills and bonds

Product description: government bills and bonds include fixed-rate, floating-rate and inflation-linked bills and bonds issued by sovereign governments.

Valuation: these instruments are generally valued using prices obtained directly from the market. Instruments that cannot be priced directly using active-market data are valued using discounted cash flow valuation techniques that incorporate market data for similar government instruments.

Fair value hierarchy: government bills and bonds are generally traded in active markets with prices that can be obtained directly from these markets, resulting in classification as Level 1, while the remaining positions are classified as Level 2 and Level 3.

Corporate and municipal bonds

Product description: corporate bonds include senior, junior and subordinated debt issued by corporate entities. Municipal bonds are issued by state and local governments. While most instruments are standard fixed- or floating-rate securities, some may have more complex coupon or embedded option features.

Valuation: corporate and municipal bonds are generally valued using prices obtained directly from the market for the security, or similar securities, adjusted for seniority, maturity and liquidity. When prices are not available, instruments are valued using discounted cash flow valuation techniques incorporating the credit spread of the issuer or similar issuers. For convertible bonds where no directly comparable price is available, issuances may be priced using a convertible bond model.

Fair value hierarchy: corporate and municipal bonds are generally classified as Level 1 or Level 2 depending on the depth of trading activity behind price sources. Level 3 instruments have no suitable pricing information available and also cannot be referenced to other securities issued by the same issuer. Therefore, such instruments are measured based on price levels for similar issuers adjusted for relative tenor and issuer quality.

Traded loans and loans designated at fair value

Product description: these instruments include fixed-rate loans, corporate loans, recently originated commercial real estate loans and contingent lending transactions.

Valuation: loans are valued directly using market prices that reflect recent transactions or quoted dealer prices, where available. Where no market price data is available, loans are valued by relative value benchmarking using pricing derived from debt instruments in comparable entities or different products in the same entity, or by using a credit default swap valuation technique, which requires inputs for credit spreads, credit recovery rates and interest rates. Recently originated commercial real estate loans are measured using a securitization approach based on rating agency guidelines. The valuation of the contingent lending transactions is dependent on actuarial mortality levels and actuarial life insurance policy lapse rates. Mortality and lapse rate assumptions are based on external actuarial estimations for large homogeneous pools, and contingencies are derived from a range relative to the actuarially expected amount.

Fair value hierarchy: instruments with suitably deep and liquid pricing information are classified as Level 2, while any positions requiring the use of valuation techniques, or for which the price sources have insufficient trading depth, are classified as Level 3.

Investment fund units

Product description: investment fund units are pools of assets, generally equity instruments and bonds, broken down to redeemable units.

Valuation: investment fund units are predominantly exchange-traded, with readily available quoted prices in liquid markets. Where market prices are not available, fair value may be measured using net asset values (NAVs), taking into account any restrictions imposed upon redemption.

Fair value hierarchy: listed units are classified as Level 1, provided there is sufficient trading activity to justify active-market classification, while other positions are classified as Level 2. Positions for which NAVs are not available or that are not redeemable at the measurement date or shortly thereafter are classified as Level 3.

Asset-backed securities

Product description: asset-backed securities (ABS) include residential mortgage-backed securities (RMBS), commercial mortgage-backed securities (CMBS), collateralized debt obligations (CDO) and other ABS and are instruments generally issued through the process of securitization of underlying interest-bearing assets.

Valuation: for liquid securities, the valuation process will use trade and price data, updated for movements in market levels between the time of trading and the time of valuation. Less liquid instruments are measured using discounted expected cash flows incorporating price data for instruments or indices with similar risk profiles. Inputs to discounted expected cash flow techniques include asset prepayment rates, discount margin or discount yields and asset default and recovery rates.

Fair value hierarchy: RMBS, CMBS and other ABS are generally classified as Level 2. However, if significant inputs are unobservable, or if market or fundamental data is not available, they are classified as Level 3.

Auction rate securities

Product description: auction rate securities (ARS) are debt or preferred equity securities that have interest rates that are reset through a periodic auction and, in the event of a failed auction, to a maximum rate as defined by each deal's prospectus. ARS are generally structured as bonds with long-term maturities (20–30 years) or preferred shares (issued by closed-end funds).

Valuation: ARS are valued using market prices that reflect recent transactions after applying an adjustment for trade size or quoted dealer prices, where available.

Fair value hierarchy: suitably deep and liquid pricing information is generally not available for ARS. As a result, these securities are classified as Level 3.

Equity instruments

Product description: equity instruments include stocks and shares, private equity positions and units held in hedge funds.

Valuation: listed equity instruments are generally valued using prices obtained directly from the market. Unlisted equity holdings, including private equity positions, are initially marked at their transaction price and are revalued when reliable evidence of price movement becomes available or when the position is deemed to be impaired. Fair value for units held in hedge funds is measured based on their published NAVs, taking into account any restrictions imposed upon redemption.

Fair value hierarchy: the majority of equity securities are actively traded on public stock exchanges where quoted prices are readily and regularly available, resulting in Level 1 classification. Units held in hedge funds are classified as Level 2, except for positions for which published NAVs are not available or that are not redeemable at the measurement date or shortly thereafter, in which case such positions are classified as Level 3.

Financial assets for unit-linked investment contracts

Product description: unit-linked investment contracts allow investors to invest in a pool of assets through issued investment units.

Valuation: the majority of assets are listed on exchanges and fair values are determined using quoted prices.

Fair value hierarchy: most assets are classified as Level 1 if actively traded, or Level 2 if trading is not active. However, instruments for which prices are not readily available are classified as Level 3.

Note 24 Fair value measurement (continued)

Securities financing transactions

Product description: securities financing transactions include (reverse) repurchase agreements (securities purchased under resale agreements and securities sold under repurchase agreements) that are managed on a fair value basis.

Valuation: these instruments are valued using discounted expected cash flow techniques. The discount rate applied is based on funding curves that are relevant to the collateral eligibility terms for the contract in question.

Fair value hierarchy: collateral funding curves for these instruments are generally observable and, as a result, these positions are classified as Level 2. Where the collateral terms are non-standard, the funding curve may be considered unobservable and these positions are classified as Level 3.

Brokerage receivables and payables

Product description: brokerage receivables and payables include callable, on-demand balances, including long cash credits, short cash debits, margin debit balances and short sale proceeds.

Valuation: fair value is determined based on the value of the underlying balances.

Fair value hierarchy: due to their on-demand nature, these receivables and payables are designated as Level 2.

Financial liabilities designated at fair value

Product description: debt instruments, primarily comprised of equity-, rates- and credit-linked issued notes, which are held at fair value under the fair value option. These instruments are tailored specifically to the holder's risk or investment appetite with structured coupons or payoffs.

Valuation: the risk management and the valuation approaches for these instruments are closely aligned with the equivalent derivatives business and the underlying risk, and the valuation techniques used for this component are the same as the relevant valuation techniques described below. For example, equity-linked notes should be referenced to equity / index contracts and credit-linked notes should be referenced to credit derivative contracts.

Fair value hierarchy: observability is closely aligned with the equivalent derivatives business and the underlying risk.

→ **Refer to Notes 19 and 22 for information about debt issued designated at fair value and other financial liabilities designated at fair value**

→ **Refer to Note 24d for more information about own credit adjustments related to financial liabilities designated at fair value**

Amounts due under unit-linked investment contracts

Product description: the financial liability represents the amounts due to unit holders.

Valuation: the fair values of investment contract liabilities are determined by reference to the fair value of the corresponding assets.

Fair value hierarchy: the liabilities themselves are not actively traded, but are mainly referenced to instruments that are actively traded and are therefore classified as Level 2.

Derivative instruments: product description, valuation and classification in the fair value hierarchy

The curves used for discounting expected cash flows in the valuation of collateralized derivatives reflect the funding terms associated with the relevant collateral arrangement for the instrument being valued. These collateral arrangements differ across counterparties with respect to the eligible currency and interest terms of the collateral. The majority of collateralized derivatives are measured using a discount curve that is based on funding rates derived from overnight interest in the cheapest eligible currency for the respective counterparty collateral agreement.

Uncollateralized and partially collateralized derivatives are discounted using the LIBOR (or equivalent) curve for the currency of the instrument. As described in Note 24d, the fair value of uncollateralized and partially collateralized derivatives is then adjusted by CVA, DVA and FVA as applicable, to reflect an estimation of the effect of counterparty credit risk, UBS's own credit risk and funding costs and benefits.

Interest rate contracts

Product description: interest rate swap contracts include interest rate swaps, basis swaps, cross-currency swaps, inflation swaps and interest rate forwards, often referred to as forward rate agreements (FRA). Interest rate option contracts include caps and floors, swaptions, swaps with complex payoff profiles and other more complex interest rate options.

Valuation: interest rate swap contracts are valued by estimating future interest cash flows and discounting those cash flows using a rate that reflects the appropriate funding rate for the position being measured. The yield curves used to estimate future index levels and discount rates are generated using market standard yield curve models using interest rates associated with current market activity. The key inputs to the models are interest rate swap rates, FRA rates, short-term interest rate futures prices, basis swap spreads and inflation swap rates. Interest rate option contracts are valued using various market standard option models, using inputs that include interest rate yield curves, inflation curves, volatilities and correlations. The volatility and correlation inputs within the models are implied from market data based on market-observed prices for standard option instruments trading within the market. Option models used to value more exotic products have a number of model parameter inputs that require calibration to enable the exotic model to price standard option instruments to the price levels observed in the market. When the maturity of the interest rate swap or option contract exceeds the term for which standard market quotes are observable for a significant input parameter, the contracts are valued by extrapolation from the last observable point using standard assumptions or by reference to another observable comparable input parameter to represent a suitable proxy for that portion of the term.

Fair value hierarchy: the majority of interest rate swaps are classified as Level 2 as the standard market contracts that form the inputs for yield curve models are generally traded in active and observable markets. Options are generally treated as Level 2 as the calibration process enables the model output to be validated to active-market levels. Models calibrated in this way are then used to revalue the portfolio of both standard options and more exotic products. In most cases, there are active and observable markets for the standard market instruments that form the inputs for yield curve models as well as the financial instruments from which volatility and correlation inputs are derived. Exotic options for which appropriate volatility or correlation input levels cannot be implied from observable market data are classified as Level 3. Interest rate swap or option contracts are classified as Level 3 when the term exceeds standard market-observable quotes.

Credit derivative contracts

Product description: a credit derivative is a financial instrument that transfers credit risk related to a single underlying entity, a portfolio of underlying entities or a pool of securitized referenced assets. Credit derivative products include credit default swaps (CDSs) on single names, indices and securitized products, plus first to default swaps and certain total return swaps.

Valuation: credit derivative contracts are valued using industry standard models based primarily on market credit spreads, upfront pricing points and implied recovery rates. Where a derivative credit spread is not directly available, it may be derived from the price of the reference cash bond. Asset-backed credit derivatives are valued using a valuation technique similar to that of the underlying security with an adjustment to reflect the funding differences between cash and synthetic form. Inputs include prepayment rates, default rates, loss severity, discount margin / rate.

Fair value hierarchy classification: single-entity and portfolio credit derivative contracts are classified as Level 2 when credit spreads and recovery rates are determined from actively traded observable market data. Where the underlying reference name(s) are not actively traded and the correlation cannot be directly mapped to actively traded tranche instruments, these contracts are classified as Level 3. Asset-backed credit derivatives follow the characteristics of the underlying security and are therefore distributed across Level 2 and Level 3.

Foreign exchange contracts

Product description: this includes open spot and forward foreign exchange (FX) contracts and OTC FX option contracts. OTC FX option contracts include standard call and put options, options with multiple exercise dates, path-dependent options, options with averaging features, options with discontinuous payoff characteristics, options on a number of underlying FX rates and multi-dimensional FX option contracts, which have a dependency on multiple FX pairs.

Valuation: open spot FX contracts are valued using the FX spot rate observed in the market. Forward FX contracts are valued using the FX spot rate adjusted for forward pricing points observed from standard market-based sources. OTC FX option contracts are valued using market standard option valuation models. The models used for shorter-dated options (i.e., maturities of five years or less) tend to be different than those used for longer-dated options because the models needed for longer-dated OTC FX contracts require additional consideration of interest rate and FX rate interdependency. Inputs to the option valuation models include spot FX rates, FX forward points, FX volatilities, interest rate yield curves, interest rate volatilities and correlations. The inputs for volatility and correlation are implied through the calibration of observed prices for standard option contracts trading within the market. The valuation for multi-dimensional FX options uses a multi-local volatility model, which is calibrated to the observed FX volatilities for all relevant FX pairs.

Fair value hierarchy: the markets for both FX spot and FX forward pricing points are both actively traded and observable and therefore such FX contracts are generally classified as Level 2. A significant proportion of OTC FX option contracts are classified as Level 2 as inputs are derived mostly from standard market contracts traded in active and observable markets. OTC FX option contracts classified as Level 3 include multi-dimensional FX options and long-dated FX exotic option contracts where there is no active market from which to derive volatility or correlation inputs.

Equity / index contracts

Product description: equity / index contracts are equity forward contracts and equity option contracts. Equity option contracts include market standard single or basket stock or index call and put options as well as equity option contracts with more complex features.

Note 24 Fair value measurement (continued)

Valuation: equity forward contracts have a single stock or index underlying and are valued using market standard models. The key inputs to the models are stock prices, estimated dividend rates and equity funding rates (which are implied from prices of forward contracts observed in the market). Estimated cash flows are then discounted using market standard discounted cash flow models using a rate that reflects the appropriate funding rate for that portion of the portfolio. When no market data is available for the instrument maturity, they are valued by extrapolation of available data, use of historical dividend data, or use of data for a related equity. Equity option contracts are valued using market standard models that estimate the equity forward level as described for equity forward contracts and incorporate inputs for stock volatility and for correlation between stocks within a basket. The probability-weighted expected option payoff generated is then discounted using market standard discounted cash flow models applying a rate that reflects the appropriate funding rate for that portion of the portfolio. When volatility, forward or correlation inputs are not available, they are valued using extrapolation of available data, historical dividend, correlation or volatility data, or the equivalent data for a related equity.

Fair value hierarchy: as inputs are derived mostly from standard market contracts traded in active and observable markets, a significant proportion of equity forward contracts are classified as Level 2. Equity option positions for which inputs are derived from standard market contracts traded in active and observable markets are also classified as Level 2. Level 3 positions are those for which volatility, forward or correlation inputs are not observable.

Commodity contracts

Product description: commodity derivative contracts include forward, swap and option contracts on individual commodities and on commodity indices.

Valuation: commodity forward and swap contracts are measured using market standard models that use market forward levels on standard instruments. Commodity option contracts are measured using market standard option models that estimate the commodity forward level as described for commodity forward and swap contracts, incorporating inputs for the volatility of the underlying index or commodity. For commodity options on baskets of commodities or bespoke commodity indices, the valuation technique also incorporates inputs for the correlation between different commodities or commodity indices.

Fair value hierarchy: individual commodity contracts are typically classified as Level 2 because active forward and volatility market data is available.

→ **Refer to Note 11 for more information about derivative instruments**

d) Valuation adjustments

The output of a valuation technique is always an estimate of a fair value that cannot be measured with complete certainty. As a result, valuations are adjusted, where appropriate and when such factors would be considered by market participants in estimating fair value, to reflect close-out costs, credit exposure, model-driven valuation uncertainty, funding costs and benefits, trading restrictions and other factors. Valuation adjustments are an important component of fair value for assets and liabilities that are measured using valuation techniques. Such adjustments are applied to reflect uncertainties within the fair value measurement process, to adjust for an identified model simplification or to incorporate an aspect of fair value that requires an overall portfolio assessment rather than an evaluation based on an individual instrument level characteristic.

Deferred day-1 profit or loss reserves

For new transactions where the valuation technique used to measure fair value requires significant inputs that are not based on observable market data, the financial instrument is initially recognized at the transaction price. The transaction price may differ from the fair value obtained using a valuation technique, where any such difference is deferred and not initially recognized in the income statement. These day-1 profit or loss reserves are reflected, where appropriate, as valuation adjustments.

Deferred day-1 profit or loss is generally released into *Other net income from financial instruments measured at fair value through profit or loss* when pricing of equivalent products or the underlying parameters become observable or when the transaction is closed out.

The table on the next page summarizes the changes in deferred day-1 profit or loss reserves during the respective period.

Note 24 Fair value measurement (continued)

Deferred day-1 profit or loss reserves

USD million	2019	2018	2017
Reserve balance at the beginning of the year	255	338	365
Profit / (loss) deferred on new transactions	171	341	247
(Profit) / loss recognized in the income statement	(278)	(417)	(279)
Foreign currency translation	(2)	(6)	6
Reserve balance at the end of the year	146	255	338

Own credit

The valuation of financial liabilities designated at fair value requires consideration of the own credit component of fair value. Own credit risk is reflected in the valuation of UBS's fair value option liabilities where this component is considered relevant for valuation purposes by UBS's counterparties and other market participants. However, own credit risk is not reflected in the valuation of UBS's liabilities that are fully collateralized or for other obligations for which it is established market practice not to include an own credit component.

Changes in the fair value of financial liabilities designated at fair value through profit or loss related to own credit are recognized in *Other comprehensive income* directly within *Retained earnings*. As UBS does not hedge changes in own credit arising on financial liabilities designated at fair value, presenting own credit within *Other comprehensive income* does not create or increase an accounting mismatch in the income statement. The unrealized and any realized own credit recognized in *Other comprehensive income* will not be reclassified to the income statement in future periods.

Own credit is estimated using an Own Credit Adjustment (OCA) curve, which incorporates observable market data, including market-observed secondary prices for UBS senior debt, UBS credit default swap (CDS) spreads and senior debt curves of peers. The table below summarizes the effects of own credit adjustments related to financial liabilities designated at fair value. The change in unrealized own credit consists of changes in fair value that are attributable to the change in UBS's credit spreads, as well as the effect of changes in fair values attributable to factors other than credit spreads, such as redemptions, effects from time decay and changes in interest and other market rates. Realized own credit is recognized when an instrument with an associated unrealized own credit adjustment is repurchased prior to the contractual maturity date. Life-to-date amounts reflect the cumulative unrealized change since initial recognition.

→ **Refer to Note 19 for more information about debt issued designated at fair value**

Own credit adjustments on financial liabilities designated at fair value

	For the year ended		
	Included in Other comprehensive income		
USD million	31.12.19	31.12.18	31.12.17
Recognized during the year:			
Realized gain / (loss)	8	(3)	22
Unrealized gain / (loss)	(408)	519	(337)
Total gain / (loss), before tax	(400)	517	(315)

	As of		
USD million	31.12.19	31.12.18	31.12.17
Recognized on the balance sheet as of the end of the year:			
Unrealized life-to-date gain / (loss)	(88)	320	(200)

Note 24 Fair value measurement (continued)

Credit valuation adjustments

In order to measure the fair value of OTC derivative instruments, including funded derivative instruments that are classified as *Financial assets at fair value not held for trading,* credit valuation adjustments (CVAs) are necessary to reflect the credit risk of the counterparty inherent in these instruments. This amount represents the estimated fair value of protection required to hedge the counterparty credit risk of such instruments. A CVA is determined for each counterparty, considering all exposures to that counterparty, and is dependent on the expected future value of exposures, default probabilities and recovery rates, applicable collateral or netting arrangements, break clauses, funding spreads and other contractual factors.

Funding valuation adjustments

Funding valuation adjustments (FVAs) reflect the costs and benefits of funding associated with uncollateralized and partially collateralized derivative receivables and payables and are calculated as the valuation effect from moving the discounting of the uncollateralized derivative cash flows from LIBOR to OCA using the CVA framework, including the probability of counterparty default. An FVA is also applied to collateralized derivative assets in cases where the collateral cannot be sold or repledged.

Debit valuation adjustments

A debit valuation adjustment (DVA) is estimated to incorporate own credit in the valuation of derivatives, effectively consistent with the CVA framework. A DVA is determined for each counterparty, considering all exposures with that counterparty and taking into account collateral netting agreements, expected future mark-to-market movements and UBS's credit default spreads.

Other valuation adjustments

Instruments that are measured as part of a portfolio of combined long and short positions are valued at mid-market levels to ensure consistent valuation of the long- and short-component risks. A liquidity valuation adjustment is then made to the overall net long or short exposure to move the fair value to bid or offer as appropriate, reflecting current levels of market liquidity. The bid–offer spreads used in the calculation of this valuation adjustment are obtained from market transactions and other relevant sources and are updated periodically.

Uncertainties associated with the use of model-based valuations are incorporated into the measurement of fair value through the use of model reserves. These reserves reflect the amounts that UBS estimates should be deducted from valuations produced directly by models to incorporate uncertainties in the relevant modeling assumptions, in the model and market inputs used, or in the calibration of the model output to adjust for known model deficiencies. In arriving at these estimates, UBS considers a range of market practices, including how it believes market participants would assess these uncertainties. Model reserves are reassessed periodically in light of data from market transactions, consensus pricing services and other relevant sources.

Valuation adjustments on financial instruments

	As of	
Life-to-date gain / (loss), USD million	31.12.19	31.12.18
Credit valuation adjustments[1]	(48)	(90)
Funding valuation adjustments	(50)	(85)
Debit valuation adjustments	1	1
Other valuation adjustments	(566)	(716)
of which: liquidity	*(300)*	*(388)*
of which: model uncertainty	*(266)*	*(327)*

1 Amounts do not include reserves against defaulted counterparties.

e) Transfers between Level 1 and Level 2

The amounts disclosed in this section reflect transfers between Level 1 and Level 2 for instruments that were held for the entire reporting period.

Assets and liabilities transferred from Level 2 to Level 1 during 2019 were not material. Assets and liabilities transferred from Level 1 to Level 2 during 2019 were also not material.

Note 24 Fair value measurement (continued)

f) Level 3 instruments: valuation techniques and inputs

The table below presents material Level 3 assets and liabilities together with the valuation techniques used to measure fair value, the significant inputs used in a given valuation technique that are considered unobservable and a range of values for those unobservable inputs. Several inputs disclosed in prior periods are not disclosed in the table below because they are not considered significant to the respective valuation technique as of 31 December 2019.

The range of values represents the highest- and lowest-level input used in the valuation techniques. Therefore, the range does not reflect the level of uncertainty regarding a particular input or an assessment of the reasonableness of UBS's estimates and assumptions, but rather the different underlying characteristics of the relevant assets and liabilities held by UBS. The ranges will therefore vary from period to period and parameter to parameter based on characteristics of the instruments held at each balance sheet date. Furthermore, the ranges of unobservable inputs may differ across other financial institutions, reflecting the diversity of the products in each firm's inventory.

Valuation techniques and inputs used in the fair value measurement of Level 3 assets and liabilities

	Fair value						Range of inputs						
	Assets		Liabilities				31.12.19			31.12.18			
USD billion	31.12.19	31.12.18	31.12.19	31.12.18	Valuation technique(s)	Significant unobservable input(s)[1]	low	high	weighted average[2]	low	high	weighted average[2]	unit[1]
Financial assets and liabilities at fair value held for trading and Financial assets at fair value not held for trading													
Corporate and municipal bonds	*0.5*	*0.7*	*0.0*	*0.0*	Relative value to market comparable	Bond price equivalent	0	143	101	0	134	89	points
Traded loans, loans designated at fair value, loan commitments and guarantees	*2.4*	*2.7*	*0.0*	*0.0*	Relative value to market comparable	Loan price equivalent	0	101	99	0	100	99	points
					Discounted expected cash flows	Credit spread	225	530		301	513		basis points
					Market comparable and securitization model	Discount margin	0	14	2	1	14	2	%
Auction rate securities	*1.5*	*1.7*			Relative value to market comparable	Bond price equivalent	79	98	88	79	99	89	points
Investment fund units[3]	*0.1*	*0.6*	*0.0*	*0.0*	Relative value to market comparable	Net asset value							
Equity instruments[3]	*0.7*	*0.6*	*0.1*	*0.0*	Relative value to market comparable	Price							
Debt issued designated at fair value[4]			*9.6*	*11.0*									
Other financial liabilities designated at fair value[4]			*1.0*	*1.0*									
Derivative financial instruments													
Interest rate contracts	*0.3*	*0.4*	*0.1*	*0.2*	Option model	Volatility of interest rates	15	63		50	81		basis points
Credit derivative contracts	*0.4*	*0.5*	*0.5*	*0.5*	Discounted expected cash flows	Credit spreads	1	700		4	545		basis points
						Bond price equivalent	0	100		3	99		points
Equity / index contracts	*0.6*	*0.5*	*1.3*	*1.4*	Option model	Equity dividend yields	0	14		0	12		%
						Volatility of equity stocks, equity and other indices	4	105		4	93		%
						Equity-to-FX correlation	(45)	71		(39)	67		%
						Equity-to-equity correlation	(17)	98		(50)	97		%

1 The ranges of significant unobservable inputs are represented in points, percentages and basis points. Points are a percentage of par (e.g., 100 points would be 100% of par). 2 Weighted averages are provided for non-derivative financial instruments and were calculated by weighting inputs based on the fair values of the respective instruments. Weighted averages are not provided for inputs related to derivative contracts as this would not be meaningful. 3 The range of inputs is not disclosed as there is a dispersion of values given the diverse nature of the investments. 4 Valuation techniques, significant unobservable inputs and the respective input ranges for Debt issued designated at fair value and Other financial liabilities designated at fair value, which are primarily comprised of over-the-counter debt instruments, are the same as the equivalent derivative or structured financing instruments presented elsewhere in this table.

Note 24 Fair value measurement (continued)

Significant unobservable inputs in Level 3 positions

This section discusses the significant unobservable inputs used in the valuation of Level 3 instruments and assesses the potential effect that a change in each unobservable input in isolation may have on a fair value measurement, including information to facilitate an understanding of factors that give rise to the input ranges shown. Relationships between observable and unobservable inputs have not been included in the summary below.

Bond price equivalent

Where market prices are not available for a bond, fair value is measured by comparison with observable pricing data from similar instruments. Factors considered when selecting comparable instruments include credit quality, maturity and industry of the issuer. Fair value may be measured either by a direct price comparison or by conversion of an instrument price into a yield (either as an outright yield or as a spread to LIBOR). Bond prices are expressed as points of the nominal, where 100 represents a fair value equal to the nominal value (i.e., par).

For corporate and municipal bonds, the range represents the range of prices from reference issuances used in determining fair value. Bonds priced at 0 are distressed to the point that no recovery is expected, while prices significantly in excess of 100 or par relate to inflation-linked or structured issuances that pay a coupon in excess of the market benchmark as of the measurement date.

For credit derivatives, the bond price range represents the range of prices used for reference instruments, which are typically converted to an equivalent yield or credit spread as part of the valuation process.

Loan price equivalent

Where market prices are not available for a traded loan, fair value is measured by comparison with observable pricing data for similar instruments. Factors considered when selecting comparable instruments include industry segment, collateral quality, maturity and issuer-specific covenants. Fair value may be measured either by a direct price comparison or by conversion of an instrument price into a yield. The range represents the range of prices derived from reference issuances of a similar credit quality used in measuring fair value for loans classified as Level 3. Loans priced at 0 are distressed to the point that no recovery is expected, while a current price of 100 represents a loan that is expected to be repaid in full.

Credit spread

Valuation models for many credit derivatives require an input for the credit spread, which is a reflection of the credit quality of the associated referenced underlying. The credit spread of a particular security is quoted in relation to the yield on a benchmark security or reference rate, typically either US Treasury or LIBOR, and is generally expressed in terms of basis points. An increase / (decrease) in credit spread will increase / (decrease) the value of credit protection offered by CDS and other credit derivative products. The income statement effect from such changes depends on the nature and direction of the positions held. Credit spreads may be negative where the asset is more creditworthy than the benchmark against which the spread is calculated. A wider credit spread represents decreasing creditworthiness. The range represents a diverse set of underlyings, with the lower end of the range representing credits of the highest quality (e.g., approximating the risk of LIBOR) and the upper end of the range representing greater levels of credit risk.

Discount margin (DM)

The DM spread represents the discount rates used to present value cash flows of an asset to reflect the market return required for uncertainty in the estimated cash flows. DM spreads are a rate or rates applied on top of a floating index (e.g., LIBOR) to discount expected cash flows. Generally, a decrease / (increase) in the DM in isolation would result in a higher / (lower) fair value.

The high end of the range relates to securities that are priced low within the market relative to the expected cash flow schedule. This indicates that the market is pricing an increased risk of credit loss into the security that is greater than what is being captured by the expected cash flow generation process. The low ends of the ranges are typical of funding rates on better-quality instruments.

Funding spread

Structured financing transactions are valued using synthetic funding curves that best represent the assets that are pledged as collateral for the transactions. They are not representative of where UBS can fund itself on an unsecured basis, but provide an estimate of where UBS can source and deploy secured funding with counterparties for a given type of collateral. The funding spreads are expressed in terms of basis points over or under LIBOR, and if funding spreads widen, this increases the effect of discounting.

A small proportion of structured debt instruments and non-structured fixed-rate bonds within financial liabilities designated at fair value had an exposure to funding spreads that was longer in duration than the actively traded market.

Volatility

Volatility measures the variability of future prices for a particular instrument and is generally expressed as a percentage, where a higher number reflects a more volatile instrument, for which future price movements are more likely to occur. The minimum level of volatility is 0% and there is no theoretical maximum. Volatility is a key input into option models, where it is used to derive a probability-based distribution of future prices for the underlying instrument. The effect of volatility on individual positions within the portfolio is driven primarily by whether the option contract is a long or short position. In most cases, the fair value of an option increases as a result of an increase in volatility and is reduced by a decrease in volatility. Generally, volatility used in the measurement of fair value is derived from active-market option prices (referred to as implied volatility). A key feature of implied volatility is the volatility "smile" or "skew," which represents the effect of pricing options of different option strikes at different implied volatility levels.

The volatility of interest rates reflects the range of unobservable volatilities across different currencies and related underlying interest rate levels. Volatilities of low interest rates tend to be much higher than volatilities of high interest rates. In addition, different currencies may have significantly different implied volatilities. The volatility of equity stocks, equity and other indices reflects the range of underlying stock volatilities.

Correlation

Correlation measures the interrelationship between the movements of two variables. It is expressed as a percentage between –100% and +100%, where +100% represents perfectly correlated variables (meaning a movement of one variable is associated with a movement of the other variable in the same direction) and –100% implies that the variables are inversely correlated (meaning a movement of one variable is associated with a movement of the other variable in the opposite direction). The effect of correlation on the measurement of fair value depends on the specific terms of the instruments being valued, reflecting the range of different payoff features within such instruments.

Equity-to-FX correlation is important for equity options based on a currency different than the currency of the underlying stock. Equity-to-equity correlation is particularly important for complex options that incorporate, in some manner, different equities in the projected payoff.

Equity dividend yields

The derivation of a forward price for an individual stock or index is important for measuring fair value for forward or swap contracts and for measuring fair value using option pricing models. The relationship between the current stock price and the forward price is based on a combination of expected future dividend levels and payment timings, and, to a lesser extent, the relevant funding rates applicable to the stock in question. Dividend yields are generally expressed as an annualized percentage of the share price with the lowest limit of 0% representing a stock that is not expected to pay any dividend. The dividend yield and timing represents the most significant parameter in determining fair value for instruments that are sensitive to an equity forward price.

Note 24 Fair value measurement (continued)

g) Level 3 instruments: sensitivity to changes in unobservable input assumptions

The table below summarizes those financial assets and liabilities classified as Level 3 for which a change in one or more of the unobservable inputs to reflect reasonably possible alternative assumptions would change fair value significantly, and the estimated effect thereof.

The table shown presents the favorable and unfavorable effects for each class of financial assets and liabilities for which the potential change in fair value is considered significant. The sensitivity data shown below presents an estimation of valuation uncertainty based on reasonably possible alternative values for Level 3 inputs at the balance sheet date and does not represent the estimated effect of stress scenarios. Typically, these financial assets and liabilities are sensitive to a combination of inputs from Levels 1–3. Although well-defined interdependencies may exist between Levels 1–2 and Level 3 parameters (e.g., between interest rates, which are generally Level 1 or Level 2, and prepayments, which are generally Level 3), these have not been incorporated in the table. Furthermore, direct interrelationships between the Level 3 parameters discussed below are not a significant element of the valuation uncertainty.

Sensitivity data is estimated using a number of techniques, including the estimation of price dispersion among different market participants, variation in modeling approaches and reasonably possible changes to assumptions used within the fair value measurement process. The sensitivity ranges are not always symmetrical around the fair values as the inputs used in valuations are not always precisely in the middle of the favorable and unfavorable range.

Sensitivity data is determined at a product or parameter level and then aggregated assuming no diversification benefit. The calculated sensitivity is applied to both the outright position and any related Level 3 hedge. The main interdependencies between sensitivities of different Level 3 products to a single unobservable input parameter have been included in the basis of netting exposures within the calculation. Aggregation without allowing for diversification involves the simple summation of individual results with the total sensitivity, therefore representing the effect of all unobservable inputs that, if moved to a reasonably possible favorable or unfavorable level at the same time, would result in a significant change in the valuation. Diversification would incorporate estimated correlations across different sensitivity results and, as such, would result in an overall sensitivity that would be less than the sum of the individual component sensitivities. UBS believes that, while there are diversification benefits within the portfolios representing these sensitivity numbers, they are not significant to this analysis.

Sensitivity of fair value measurements to changes in unobservable input assumptions

	31.12.19		31.12.18	
USD million	Favorable changes	Unfavorable changes	Favorable changes	Unfavorable changes
Traded loans, loans designated at fair value, loan commitments and guarantees	46	(21)	99	(44)
Securities financing transactions	11	(11)	17	(11)
Auction rate securities	87	(87)	81	(81)
Asset-backed securities	35	(40)	27	(23)
Equity instruments	140	(80)	155	(94)
Interest rate derivative contracts, net	8	(17)	8	(39)
Credit derivative contracts, net	31	(35)	33	(37)
Foreign exchange derivative contracts, net	12	(8)	10	(5)
Equity / index derivative contracts, net	183	(197)	213	(225)
Other	47	(51)	19	(19)
Total	600	(547)	661	(578)

h) Level 3 instruments: movements during the period

The table on the following pages presents additional information about material Level 3 assets and liabilities measured at fair value on a recurring basis. Level 3 assets and liabilities may be hedged with instruments classified as Level 1 or Level 2 in the fair value hierarchy and, as a result, realized and unrealized gains and losses included in the table may not include the effect of related hedging activity. Furthermore, the realized and unrealized gains and losses presented within the table are not limited solely to those arising from Level 3 inputs, as valuations are generally derived from both observable and unobservable parameters.

Assets and liabilities transferred into or out of Level 3 are presented as if those assets or liabilities had been transferred at the beginning of the year.

Upon adoption of IFRS 9 on 1 January 2018, certain financial assets and liabilities were newly classified at fair value through profit or loss and were designated as Level 3 in the fair value hierarchy. Certain assets were also reclassified from *Financial assets measured at fair value through other comprehensive income* to *Financial assets at fair value not held for trading*.

Assets transferred into and out of Level 3 totaled USD 1.1 billion and USD 1.9 billion, respectively. Transfers into Level 3 mainly consisted of loans, investment fund units and equity / index contracts, reflecting decreased observability of the relevant valuation inputs. Transfers out of Level 3 mainly consisted of loans, reflecting increased observability of the relevant valuation inputs.

Liabilities transferred into and out of Level 3 totaled USD 1.4 billion and USD 3.4 billion, respectively. Transfers into and out of Level 3 mainly consisted of debt issued designated at fair value, primarily equity-linked issued debt instruments, due to decreased or increased observability, respectively, of the embedded derivative inputs.

Note 24 Fair value measurement (continued)

Movements of Level 3 instruments

USD billion	Balance as of 31 December 2017	Reclassifications and remeasurements upon adoption of IFRS 9	Balance as of 1 January 2018	Total gains / losses included in comprehensive income: Net gains / losses included in income[1]	Total gains / losses included in comprehensive income: *of which: related to Level 3 instruments held at the end of the reporting period*	Purchases	Sales	Issuances	Settlements	Transfers into Level 3	Transfers out of Level 3	Foreign currency translation
Financial assets at fair value held for trading	**2.0**	**0.4**	**2.4**	**(0.2)**	***(0.2)***	**2.1**	**(7.1)**	**4.2**	**0.0**	**0.7**	**(0.2)**	**0.0**
of which:												
Investment fund units	*0.6*		*0.6*	*(0.1)*	*(0.1)*	*0.2*	*(0.3)*	*0.0*	*0.0*	*0.1*	*(0.1)*	*0.0*
Corporate and municipal bonds	*0.6*		*0.6*	*0.0*	*0.0*	*0.6*	*(0.9)*	*0.0*	*0.0*	*0.5*	*0.0*	*0.0*
Loans	*0.5*	*0.4*	*0.9*	*0.1*	*0.0*	*0.9*	*(5.6)*	*4.2*	*0.0*	*0.1*	*0.0*	*0.0*
Other	*0.4*		*0.4*	*(0.1)*	*(0.1)*	*0.4*	*(0.4)*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Derivative financial instruments – assets	**1.6**		**1.6**	**0.0**	***0.0***	**0.0**	**0.0**	**1.0**	**(1.5)**	**0.5**	**(0.1)**	**0.0**
of which:												
Interest rate contracts	*0.1*		*0.1*	*0.1*	*0.1*	*0.0*	*0.0*	*0.0*	*(0.1)*	*0.3*	*0.0*	*0.0*
Equity / index contracts	*0.7*		*0.7*	*0.0*	*0.0*	*0.0*	*0.0*	*0.8*	*(1.0)*	*0.1*	*(0.1)*	*0.0*
Credit derivative contracts	*0.6*		*0.6*	*0.0*	*0.0*	*0.0*	*0.0*	*0.3*	*(0.4)*	*0.0*	*0.0*	*0.0*
Other	*0.2*		*0.2*	*(0.1)*	*(0.1)*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Financial assets at fair value not held for trading	**1.5**	**3.0**	**4.4**	**0.0**	***0.0***	**1.7**	**(1.9)**	**0.0**	**0.0**	**0.1**	**(0.1)**	**0.1**
of which:												
Loans	*0.8*	*0.6*	*1.4*	*(0.2)*	*(0.2)*	*1.5*	*(1.0)*	*0.0*	*0.0*	*0.1*	*0.0*	*0.0*
Auction rate securities		*1.9*	*1.9*	*0.1*	*0.1*	*0.0*	*(0.4)*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*
Equity instruments		*0.4*	*0.4*	*0.1*	*0.1*	*0.2*	*(0.2)*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Other	*0.7*	*0.1*	*0.8*	*0.0*	*0.0*	*0.0*	*(0.4)*	*0.0*	*0.0*	*0.0*	*(0.1)*	*0.0*
Financial assets measured at fair value through other comprehensive income	**0.5**	**(0.5)**										
Derivative financial instruments – liabilities	**2.9**	**0.0**	**2.9**	**(0.3)**	***(0.2)***	**0.0**	**0.0**	**1.3**	**(1.5)**	**0.3**	**(0.5)**	**0.0**
of which:												
Equity / index contracts	*2.0*		*2.0*	*(0.3)*	*(0.2)*	*0.0*	*0.0*	*1.2*	*(1.2)*	*0.3*	*(0.5)*	*0.0*
Credit derivative contracts	*0.6*		*0.6*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*	*(0.2)*	*0.1*	*0.0*	*0.0*
Other	*0.3*	*0.0*	*0.3*	*0.0*	*0.1*	*0.0*	*0.0*	*0.0*	*(0.1)*	*0.0*	*0.0*	*0.0*
Debt issued designated at fair value	**11.2**		**11.2**	**0.5**	***0.0***	**0.0**	**0.0**	**5.8**	**(4.3)**	**2.2**	**(4.3)**	**(0.2)**
Other financial liabilities designated at fair value	**2.0**		**2.0**	**0.0**	***0.0***	**0.0**	**0.0**	**1.1**	**(2.0)**	**0.0**	**0.0**	**0.0**

1 Net gains / losses included in comprehensive income are comprised of Net interest income, Other net income from financial instruments measured at fair value through profit or loss and Other income. 2 Total Level 3 assets as of 31 December 2019 were USD 7.2 billion (31 December 2018: USD 7.8 billion). Total Level 3 liabilities as of 31 December 2019 were USD 12.8 billion (31 December 2018: USD 14.3 billion).

Balance as of 31 December 2018[2]	Total gains / losses included in comprehensive income: Net gains / losses included in income[1]	Total gains / losses included in comprehensive income: *of which: related to Level 3 instruments held at the end of the reporting period*	Purchases	Sales	Issuances	Settlements	Transfers into Level 3	Transfers out of Level 3	Foreign currency translation	Balance as of 31 December 2019[2]
2.0	(0.2)	*0.0*	1.2	(5.7)	4.4	0.0	0.6	(0.4)	0.0	1.8
0.4	*0.0*	*0.0*	*0.0*	*(0.4)*	*0.0*	*0.0*	*0.2*	*(0.2)*	*0.0*	*0.0*
0.7	*0.0*	*0.0*	*0.6*	*(0.6)*	*0.0*	*0.0*	*0.1*	*(0.2)*	*0.0*	*0.5*
0.7	*(0.1)*	*0.0*	*0.2*	*(4.4)*	*4.4*	*0.0*	*0.1*	*0.0*	*0.0*	*0.8*
0.2	*0.0*	*(0.1)*	*0.3*	*(0.3)*	*0.0*	*0.0*	*0.2*	*0.0*	*0.0*	*0.4*
1.4	(0.3)	*0.0*	0.0	0.0	1.0	(0.8)	0.2	(0.3)	0.0	1.3
0.4	*(0.1)*	*0.0*	*0.0*	*0.0*	*0.1*	*0.0*	*0.0*	*(0.2)*	*0.0*	*0.3*
0.5	*(0.1)*	*0.1*	*0.0*	*0.0*	*0.6*	*(0.5)*	*0.1*	*(0.1)*	*0.0*	*0.6*
0.5	*(0.1)*	*(0.1)*	*0.0*	*0.0*	*0.2*	*(0.2)*	*0.1*	*(0.1)*	*0.0*	*0.4*
0.0	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
4.4	0.0	*0.0*	1.2	(0.8)	0.0	0.0	0.3	(1.2)	0.0	4.0
1.8	*0.0*	*0.0*	*0.7*	*(0.2)*	*0.0*	*0.0*	*0.3*	*(1.2)*	*0.0*	*1.2*
1.7	*0.0*	*0.0*	*0.0*	*(0.1)*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*1.5*
0.5	*0.0*	*0.0*	*0.1*	*(0.2)*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.5*
0.5	*0.0*	*0.0*	*0.5*	*(0.2)*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.7*
2.2	0.0	*0.0*	0.0	0.0	0.8	(1.0)	0.3	(0.3)	0.0	2.0
1.4	*0.3*	*0.2*	*0.0*	*0.0*	*0.6*	*(0.9)*	*0.2*	*(0.2)*	*0.0*	*1.3*
0.5	*(0.1)*	*(0.1)*	*0.0*	*0.0*	*0.2*	*(0.1)*	*0.1*	*(0.1)*	*0.0*	*0.5*
0.3	*(0.1)*	*0.0*	*0.0*	*0.0*	*0.1*	*0.0*	*0.0*	*(0.1)*	*0.0*	*0.2*
11.0	1.1	*0.7*	0.0	0.0	6.9	(7.3)	1.0	(3.1)	0.0	9.6
1.0	0.2	*0.1*	0.0	0.0	0.6	(0.8)	0.1	0.0	0.0	1.0

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Note 24 Fair value measurement (continued)

i) Maximum exposure to credit risk for financial instruments measured at fair value

The tables below provide UBS AG's maximum exposure to credit risk for financial instruments measured at fair value and the respective collateral and other credit enhancements mitigating credit risk for these classes of financial instruments.

The maximum exposure to credit risk includes the carrying amounts of financial instruments recognized on the balance sheet subject to credit risk and the notional amounts for off-balance sheet arrangements. Where information is available, collateral is presented at fair value. For other collateral, such as real estate, a reasonable alternative value is used. Credit enhancements, such as credit derivative contracts and guarantees, are included at their notional amounts. Both are capped at the maximum exposure to credit risk for which they serve as security. The "Risk management and control" section of this report describes management's view of credit risk and the related exposures, which can differ in certain respects from the requirements of IFRS.

Maximum exposure to credit risk

	31.12.19								
		Collateral				Credit enhancements			
USD billion	Maximum exposure to credit risk	Cash collateral received	Collateral-ized by securities	Secured by real estate	Other collateral[1]	Netting	Credit derivative contracts	Guarantees	Exposure to credit risk after collateral and credit enhancements
Financial assets measured at fair value on the balance sheet									
Financial assets at fair value held for trading – debt instruments[2, 3]	22.0								22.0
Derivative financial instruments[4]	121.8		3.3			107.4			11.1
Brokerage receivables	18.0	0.0	17.8						0.2
Financial assets at fair value not held for trading – debt instruments[5]	55.0	0.1	16.3		0.1				38.6
Total financial assets measured at fair value	**216.8**	**0.1**	**37.4**	**0.0**	**0.1**	**107.4**	**0.0**	**0.0**	**71.9**
Guarantees[6]	1.0							0.3	0.7
Loan commitments[6]	6.3				3.0		0.1	0.9	2.3
Forward starting transactions, reverse repurchase and securities borrowing agreements	20.3		20.3						0.0
Total maximum exposure to credit risk not reflected on the balance sheet	**27.6**	**0.0**	**20.3**	**0.0**	**3.0**	**0.0**	**0.1**	**1.2**	**3.0**

	31.12.18								
		Collateral				Credit enhancements			
USD billion	Maximum exposure to credit risk	Cash collateral received	Collateral-ized by securities	Secured by real estate	Other collateral[1]	Netting	Credit derivative contracts	Guarantees	Exposure to credit risk after collateral and credit enhancements
Financial assets measured at fair value on the balance sheet									
Financial assets at fair value held for trading – debt instruments[2, 3]	22.0								22.0
Derivative financial instruments[4]	126.2		4.1			110.8			11.4
Brokerage receivables	16.8	0.0	16.5						0.3
Financial assets at fair value not held for trading – debt instruments[5]	59.8		16.7		0.1				43.1
Total financial assets measured at fair value	**224.9**	**0.0**	**37.3**	**0.0**	**0.1**	**110.8**	**0.0**	**0.0**	**76.7**
Guarantees[6]	1.6							0.2	1.4
Loan commitments[6]	3.5				2.4		0.2	0.1	0.7
Forward starting transactions, reverse repurchase and securities borrowing agreements	8.1		8.1						0.0
Total maximum exposure to credit risk not reflected on the balance sheet	**13.3**	**0.0**	**8.1**	**0.0**	**2.4**	**0.0**	**0.2**	**0.4**	**2.1**

1 Includes but is not limited to life insurance contracts, inventory, mortgage loans, gold and other commodities. 2 These positions are generally managed under the market risk framework. For the purpose of this disclosure, collateral and credit enhancements were not considered. 3 Does not include investment fund units. 4 The amount shown in the "Netting" column represents the netting potential not recognized on the balance sheet. Refer to Note 25 for more information. 5 Financial assets at fair value not held for trading collateralized by securities consisted of structured loans and reverse repurchase and securities borrowing agreements. 6 The amount shown in the "Guarantees" column largely relates to sub-participations. Refer to Note 34 for more information.

Note 24 Fair value measurement (continued)

j) Financial instruments not measured at fair value

The table below provides the estimated fair values of financial instruments not measured at fair value.

Financial instruments not measured at fair value[1]

	31.12.19						31.12.18					
	Carrying amount	Fair value					Carrying amount	Fair value				
USD billion	Total	Carrying amount approximates fair value[2]	Level 1	Level 2	Level 3	Total	Total	Carrying amount approximates fair value[2]	Level 1	Level 2	Level 3	Total
Assets[3]												
Cash and balances at central banks	107.1	107.0	0.1	0.0	0.0	107.1	108.4	108.3	0.1	0.0	0.0	108.4
Loans and advances to banks	12.4	11.7	0.0	0.5	0.2	12.4	16.6	16.0	0.0	0.6	0.0	16.6
Receivables from securities financing transactions	84.2	74.0	0.0	8.6	1.6	84.2	95.3	85.0	0.0	6.9	3.4	95.4
Cash collateral receivables on derivative instruments	23.3	23.3	0.0	0.0	0.0	23.3	23.6	23.6	0.0	0.0	0.0	23.6
Loans and advances to customers	328.0	152.5	0.0	25.7	152.2	330.3	321.5	153.8	0.0	18.6	149.5	322.0
Other financial assets measured at amortized cost	23.0	5.8	8.4	6.4	2.8	23.3	22.6	5.9	8.4	4.8	3.3	22.5
Liabilities												
Amounts due to banks	6.6	5.6	0.0	0.9	0.0	6.6	11.0	8.8	0.0	1.9	0.2	11.0
Payables from securities financing transactions	7.8	7.5	0.0	0.3	0.0	7.8	10.3	10.0	0.0	0.3	0.0	10.3
Cash collateral payables on derivative instruments	31.4	31.4	0.0	0.0	0.0	31.4	28.9	28.9	0.0	0.0	0.0	28.9
Customer deposits	450.6	440.5	0.0	10.2	0.0	450.7	422.0	410.6	0.0	11.3	0.1	422.0
Funding from UBS Group AG and its subsidiaries	47.9	0.0	0.0	49.6	0.0	49.6	41.2	0.0	0.0	41.7	0.0	41.7
Debt issued measured at amortized cost	62.8	8.7	0.0	55.5	0.0	64.3	91.2	9.9	0.0	82.1	1.4	93.5
Other financial liabilities measured at amortized cost[4]	6.5	6.5	0.0	0.0	0.0	6.5	7.6	7.6	0.0	0.0	0.1	7.6

1 In line with IFRS 7 Financial Instruments: Disclosures, effective 2019, UBS no longer discloses a fair value hierarchy level for financial instruments where the carrying amount approximates fair value. Prior periods have been restated for this change. 2 Includes certain financial instruments where the carrying amount is a reasonable approximation of the fair value due to the instruments' short-term nature (instruments that are receivable or payable on demand, or with a remaining maturity (excluding the effects of callable features) of three months or less). 3 As of 31 December 2019, USD 0 billion of Loans and advances to banks, USD 1 billion of Receivables from securities financing transactions, USD 140 billion of Loans and advances to customers and USD 16 billion of Other financial assets measured at amortized cost are expected to be recovered or settled after 12 months. As of 31 December 2018, USD 0 billion of Loans and advances to banks, USD 1 billion of Receivables from securities financing transactions, USD 139 billion of Loans and advances to customers and USD 15 billion of Other financial assets measured at amortized cost were expected to be recovered or settled after 12 months. 4 Excludes lease liabilities.

The fair values included in the table above were calculated for disclosure purposes only. The valuation techniques and assumptions described below relate only to the fair value of UBS's financial instruments not measured at fair value. Other institutions may use different methods and assumptions for their fair value estimation, and therefore such fair value disclosures cannot necessarily be compared from one financial institution to another. The following principles were applied when determining fair value estimates for financial instruments not measured at fair value:

– For financial instruments with remaining maturities greater than three months, the fair value was determined from quoted market prices, if available.
– Where quoted market prices were not available, the fair values were estimated by discounting contractual cash flows using current market interest rates or appropriate yield curves for instruments with similar credit risk and maturity. These estimates generally include adjustments for counterparty credit risk or UBS's own credit.
– For short-term financial instruments with remaining maturities of three months or less, the carrying amount, which is net of credit loss allowances, is generally considered a reasonable estimate of fair value.

Note 25 Offsetting financial assets and financial liabilities

UBS AG enters into netting agreements with counterparties to manage the credit risks associated primarily with repurchase and reverse repurchase transactions, securities borrowing and lending, over-the-counter derivatives and exchange-traded derivatives. These netting agreements and similar arrangements generally enable the counterparties to set off liabilities against available assets received in the ordinary course of business and/or in the event that the counterparties to the transaction are unable to fulfill their contractual obligations. The right of setoff is a legal right to settle or otherwise eliminate all or a portion of an amount due by applying an amount receivable from the same counterparty against it, thus reducing credit exposure.

The table below provides a summary of financial assets subject to offsetting, enforceable master netting arrangements and similar agreements, as well as financial collateral received to mitigate credit exposures for these financial assets. The gross financial assets of UBS AG that are subject to offsetting, enforceable netting arrangements and similar agreements are reconciled to the net amounts presented within the associated balance sheet line, after giving effect to financial liabilities with the same counterparties that have been offset on the balance sheet and other financial assets not subject to an enforceable netting arrangement or similar agreement, as well as other out-of-scope items. Furthermore, related amounts for financial liabilities and collateral received that are not offset on the balance sheet are shown to arrive at financial assets after consideration of netting potential.

UBS AG engages in a variety of counterparty credit mitigation strategies in addition to netting and collateral arrangements. Therefore, the net amounts presented in the tables on this and on the next page do not purport to represent their actual credit exposure.

Financial assets subject to offsetting, enforceable master netting arrangements and similar agreements

	Assets subject to netting arrangements								
	Netting recognized on the balance sheet			Netting potential not recognized on the balance sheet[3]			Assets not subject to netting arrangements[4]	Total assets	
As of 31.12.19, USD billion	Gross assets before netting	Netting with gross liabilities[2]	Net assets recognized on the balance sheet	Financial liabilities	Collateral received	Assets after consideration of netting potential	Assets recognized on the balance sheet	Total assets after consideration of netting potential	Total assets recognized on the balance sheet
Receivables from securities financing transactions	83.2	(14.0)	69.2	(1.2)	(68.0)	0.0	15.0	15.0	84.2
Derivative financial instruments	120.2	(3.4)	116.8	(89.3)	(21.4)	6.1	5.0	11.1	121.8
Cash collateral receivables on derivative instruments[1]	26.4	(4.0)	22.4	(13.3)	(1.1)	8.0	0.9	8.9	23.3
Financial assets at fair value not held for trading	83.1	(77.5)	5.6	0.0	(5.6)	0.0	78.0	78.0	83.6
of which: reverse repurchase agreements	*83.0*	*(77.5)*	*5.4*	*0.0*	*(5.4)*	*0.0*	*0.9*	*0.9*	*6.3*
Total assets	313.0	(98.9)	214.0	(103.8)	(96.1)	14.1	99.0	113.1	313.0
As of 31.12.18, USD billion									
Receivables from securities financing transactions	88.5	(13.0)	75.5	(4.4)	(71.2)	0.0	19.8	19.8	95.3
Derivative financial instruments	124.3	(4.3)	120.0	(90.8)	(24.0)	5.2	6.2	11.4	126.2
Cash collateral receivables on derivative instruments[1]	24.6	(2.3)	22.3	(13.5)	(1.0)	7.8	1.3	9.1	23.6
Financial assets at fair value not held for trading	85.4	(77.5)	7.8	(1.4)	(6.4)	0.0	74.6	74.6	82.4
of which: reverse repurchase agreements	*85.3*	*(77.5)*	*7.8*	*(1.4)*	*(6.4)*	*0.0*	*2.1*	*2.1*	*9.9*
Total assets	322.9	(97.2)	225.7	(110.0)	(102.6)	13.0	101.9	114.9	327.6

1 The net amount of Cash collateral receivables on derivative instruments recognized on the balance sheet includes certain OTC derivatives that are net settled on a daily basis either legally or in substance under IAS 32 principles and exchange-traded derivatives that are economically settled on a daily basis. 2 The logic of the table results in amounts presented in the "Netting with gross liabilities" column corresponding directly to the amounts presented in the "Netting with gross assets" column in the liabilities table presented on the following page. Netting in this column for reverse repurchase agreements presented within the lines "Receivables from securities financing transactions" and "Financial assets at fair value not held for trading" taken together corresponds to the amounts presented for repurchase agreements in the "Payables from securities financing transactions" and "Other financial liabilities designated at fair value" lines in the liabilities table presented on the following page. 3 For the purpose of this disclosure, the amounts of financial instruments and cash collateral presented have been capped so as not to exceed the net amount of financial assets presented on the balance sheet; i.e., over-collateralization, where it exists, is not reflected in the table. 4 Includes assets not subject to enforceable netting arrangements and other out-of-scope items.

Note 25 Offsetting financial assets and financial liabilities (continued)

The table below provides a summary of financial liabilities subject to offsetting, enforceable master netting arrangements and similar agreements, as well as financial collateral pledged to mitigate credit exposures for these financial liabilities. The gross financial liabilities of UBS AG that are subject to offsetting, enforceable netting arrangements and similar agreements are reconciled to the net amounts presented within the associated balance sheet line, after giving effect to financial assets with the same counterparties that have been offset on the balance sheet and other financial liabilities not subject to an enforceable netting arrangement or similar agreement. Furthermore, related amounts for financial assets and collateral pledged that are not offset on the balance sheet are shown to arrive at financial liabilities after consideration of netting potential.

Financial liabilities subject to offsetting, enforceable master netting arrangements and similar agreements

	Liabilities subject to netting arrangements						Liabilities not subject to netting arrangements[4]	Total liabilities	
	Netting recognized on the balance sheet			Netting potential not recognized on the balance sheet[3]					
As of 31.12.19, USD billion	Gross liabilities before netting	Netting with gross assets[2]	Net liabilities recognized on the balance sheet	Financial assets	Collateral pledged	Liabilities after consideration of netting potential	Liabilities recognized on the balance sheet	Total liabilities after consideration of netting potential	Total liabilities recognized on the balance sheet
Payables from securities financing transactions	19.8	(14.0)	5.8	(0.8)	(5.0)	0.0	2.0	2.0	7.8
Derivative financial instruments	118.1	(3.4)	114.8	(89.3)	(16.8)	8.6	6.1	14.8	120.9
Cash collateral payables on derivative instruments[1]	34.2	(4.0)	30.1	(16.5)	(1.7)	12.0	1.3	13.3	31.4
Other financial liabilities designated at fair value	83.5	(77.6)	5.9	(0.4)	(5.6)	0.0	30.2	30.2	36.2
of which: repurchase agreements	*83.1*	*(77.6)*	*5.5*	*(0.4)*	*(5.2)*	*0.0*	*0.2*	*0.2*	*5.7*
Total liabilities	255.6	(98.9)	156.6	(107.0)	(29.0)	20.6	39.6	60.2	196.2
As of 31.12.18, USD billion									
Payables from securities financing transactions	20.6	(12.4)	8.3	(3.6)	(4.7)	0.0	2.0	2.0	10.3
Derivative financial instruments	124.1	(4.3)	119.8	(90.8)	(20.9)	8.1	5.9	14.0	125.7
Cash collateral payables on derivative instruments[1]	29.0	(2.3)	26.7	(14.2)	(1.2)	11.3	2.2	13.5	28.9
Other financial liabilities designated at fair value	86.6	(78.2)	8.4	(2.1)	(5.9)	0.4	25.2	25.6	33.6
of which: repurchase agreements	*86.1*	*(78.2)*	*7.9*	*(2.1)*	*(5.9)*	*0.0*	*1.6*	*1.6*	*9.5*
Total liabilities	**260.4**	**(97.2)**	**163.2**	**(110.7)**	**(32.6)**	**19.8**	**35.4**	**55.2**	**198.5**

1 The net amount of Cash collateral payables on derivative instruments recognized on the balance sheet includes certain exchange-traded derivatives that are net settled on a daily basis either legally or in substance under IAS 32 principles and exchange-traded derivatives that are economically settled on a daily basis. 2 The logic of the table results in amounts presented in the "Netting with gross assets" column corresponding to the amounts presented in the "Netting with gross liabilities" column in the assets table presented on the previous page. Netting in this column for repurchase agreements presented within the lines "Payables from securities financing transactions" and "Other financial liabilities designated at fair value" taken together corresponds to the amounts presented for reverse repurchase agreements in the "Receivables from securities financing transactions" and "Financial assets at fair value not held for trading" lines in the assets table presented on the previous page. 3 For the purpose of this disclosure, the amounts of financial instruments and cash collateral pledged have been capped so as not to exceed the net amount of financial liabilities presented on the balance sheet; i.e., over-collateralization, where it exists, is not reflected in the table. 4 Includes liabilities not subject to enforceable netting arrangements and other out-of-scope items.

Note 26 Restricted and transferred financial assets

This Note provides information about restricted financial assets (Note 26a), transfers of financial assets (Note 26b and 26c) and financial assets that are received as collateral with the right to resell or repledge these assets (Note 26d).

a) Restricted financial assets

Restricted financial assets consist of assets pledged as collateral against an existing liability or contingent liability and other assets that are otherwise explicitly restricted such that they cannot be used to secure funding.

Financial assets are mainly pledged as collateral in securities lending transactions, in repurchase transactions, against loans from Swiss mortgage institutions and in connection with the issuance of covered bonds. The UBS AG generally enters into repurchase and securities lending arrangements under standard market agreements. For securities lending, the cash received as collateral may be more or less than the fair value of the securities loaned, depending on the nature of the transaction. For repurchase agreements, the fair value of the collateral sold under an agreement to repurchase is generally in excess of the cash borrowed. Pledged mortgage loans serve as collateral for existing liabilities against Swiss central mortgage institutions and for existing covered bond issuances of USD 11,206 million as of 31 December 2019 (31 December 2018: USD 12,516 million).

Other restricted financial assets include assets protected under client asset segregation rules, assets held by the UBS AG's insurance entities to back related liabilities to the policy holders, assets held in certain jurisdictions to comply with explicit minimum local asset maintenance requirements and assets held in consolidated bankruptcy remote entities, such as certain investment funds and other structured entities. The carrying amount of the liabilities associated with these other restricted financial assets is generally equal to the carrying amount of the assets, with the exception of assets held to comply with local asset maintenance requirements, for which the associated liabilities are greater.

Restricted financial assets

USD million	31.12.19	31.12.18
Financial assets pledged as collateral		
Financial assets at fair value held for trading	56,548	43,292
of which: assets pledged as collateral that may be sold or repledged by counterparties	*41,285*	*32,121*
Loans and advances to customers[1]	18,399	18,804
Financial assets at fair value not held for trading	188	0
Debt securities classified as Other financial assets measured at amortized cost	1,212	0
of which: assets pledged as collateral that may be sold or repledged by counterparties	*1,212*	*0*
Total financial assets pledged as collateral[2]	76,347	62,096
Other restricted financial assets		
Loans and advances to banks	2,353	5,140
Financial assets at fair value held for trading	242	1,054
Cash collateral receivables on derivative instruments	2,986	3,205
Loans and advances to customers	620	935
Financial assets at fair value not held for trading	29,368	23,212
Financial assets measured at fair value through other comprehensive income	176	171
Other	382	203
Total other restricted financial assets	36,126	33,920
Total financial assets pledged and other restricted financial assets	112,474	96,016

1 All related to mortgage loans that serve as collateral for existing liabilities against Swiss central mortgage institutions and for existing covered bond issuances. Of these pledged mortgage loans, approximately USD 6.3 billion for 31 December 2019 (31 December 2018: approximately USD 3.2 billion) could be withdrawn or used for future liabilities or covered bond issuances without breaching existing collateral requirements. 2 Does not include assets placed with central banks related to undrawn credit lines and for payment, clearing and settlement purposes (31 December 2019: USD 0.6 billion; 31 December 2018: USD 0.3 billion).

In addition to restrictions on financial assets, UBS AG and its subsidiaries are, in certain cases, subject to regulatory requirements that affect the transfer of dividends and capital within UBS AG, as well as intercompany lending. Supervisory authorities also may require entities to measure capital and leverage ratios on a stressed basis, such as the Federal Reserve Board's Comprehensive Capital Analysis and Review (CCAR) process, which may limit the relevant subsidiaries' ability to make distributions of capital based on the results of those tests.

Note 26 Restricted and transferred financial assets (continued)

Supervisory authorities generally have discretion to impose higher requirements or to otherwise limit the activities of subsidiaries.

Non-regulated subsidiaries are generally not subject to such requirements and transfer restrictions. However, restrictions can also be the result of different legal, regulatory, contractual, entity- or country-specific arrangements and/or requirements.

→ **Refer to "Financial and regulatory key figures for our significant regulated subsidiaries and sub-groups" in the "Significant regulated subsidiary and sub-group information" section of this report for financial information about significant regulated subsidiaries of UBS AG**

b) Transferred financial assets that are not derecognized in their entirety

The table below presents information for financial assets that have been transferred but are subject to continued recognition in full, as well as recognized liabilities associated with those transferred assets.

Transferred financial assets subject to continued recognition in full

USD million	31.12.19		31.12.18	
	Carrying amount of transferred assets	Carrying amount of associated liabilities recognized on balance sheet	Carrying amount of transferred assets	Carrying amount of associated liabilities recognized on balance sheet
Financial assets at fair value held for trading that may be sold or repledged by counterparties	41,285	16,671	32,121	4,674
relating to securities lending and repurchase agreements in exchange for cash received	*16,945*	*16,671*	*4,726*	*4,674*
relating to securities lending agreements in exchange for securities received	*24,082*	*0*	*26,234*	*0*
relating to other financial asset transfers	*258*	*0*	*1,161*	*0*
Financial assets at fair value not held for trading that may be sold or repledged by counterparties	188	187	0	0
Total financial assets transferred	**41,473**	**16,858**	**32,121**	**4,674**

Transactions in which financial assets are transferred, but continue to be recognized in their entirety on UBS AG's balance sheet include securities lending and repurchase agreements as well as other financial asset transfers. Repurchase and securities lending arrangements are, for the most part, conducted under standard market agreements and are undertaken with counterparties subject to UBS AG's normal credit risk control processes.

→ **Refer to Note 1a item 3e for more information about repurchase and securities lending agreements**

As of 31 December 2019, approximately 40% of the transferred financial assets were assets held for trading transferred in exchange for cash, in which case the associated recognized liability represents the amount to be repaid to counterparties. For securities lending and repurchase agreements, a haircut between 0% and 15% is generally applied to the transferred assets, which results in associated liabilities having a carrying amount below the carrying amount of the transferred assets. The counterparties to the associated liabilities presented in the table above have full recourse to UBS AG.

In securities lending arrangements entered into in exchange for the receipt of other securities as collateral, neither the securities received nor the obligation to return them are recognized on UBS AG's balance sheet, as the risks and rewards of ownership are not transferred to UBS AG. In cases where such financial assets received are subsequently sold or repledged in another transaction, this is not considered to be a transfer of financial assets.

Other financial asset transfers primarily include securities transferred to collateralize derivative transactions, for which the carrying amount of associated liabilities is not provided in the table above because those replacement values are managed on a portfolio basis across counterparties and product types, and therefore there is no direct relationship between the specific collateral pledged and the associated liability.

Transferred financial assets that are not subject to derecognition in full, but remain on the balance sheet to the extent of UBS AG's continuing involvement, were not material as of 31 December 2019 and as of 31 December 2018.

Note 26 Restricted and transferred financial assets (continued)

c) Transferred financial assets that are derecognized in their entirety with continuing involvement

Continuing involvement in a transferred and fully derecognized financial asset may result from contractual provisions in the transfer agreement or from a separate agreement with the counterparty or a third party entered into in connection with the transfer.

Purchased and retained interests in securitization vehicles

In cases where UBS AG has transferred assets into a securitization vehicle and retained or purchased interests therein, UBS AG has a continuing involvement in those transferred assets.

As of 31 December 2019, the majority of the retained continuing involvement related to securitization positions held as financial assets at fair value held for trading, primarily collateralized debt obligations, US commercial mortgage-backed securities and residential mortgage-backed securities. The fair value and carrying amount of UBS AG's continuing involvement related to these purchased and retained interests was USD 351 million as of 31 December 2019, and UBS AG recognized gains of USD 0 million in 2019 related to these positions. As of 31 December 2019, life-to-date losses of USD 1,198 million were recorded related to the positions held as of 31 December 2019.

As of 31 December 2018, the fair value and carrying amount of UBS AG's continuing involvement related to purchased and retained interests in securitization vehicles was USD 6 million, and UBS AG recognized gains of USD 3 million in 2018 related to these positions. As of 31 December 2018, life-to-date losses of USD 1,198 million were recorded related to the positions held as of 31 December 2018.

The maximum exposure to loss related to purchased and retained interests in securitization structures was USD 8 million as of 31 December 2019, compared with USD 10 million as of 31 December 2018.

Undiscounted cash outflows of USD 3 million may be payable to the transferee in future periods as a consequence of holding the purchased and retained interests. The earliest period in which payment may be required is less than one month.

d) Off-balance sheet assets received

The table below presents assets received from third parties that can be sold or repledged and that are not recognized on the balance sheet, but that are held as collateral, including amounts that have been sold or repledged.

Off-balance sheet assets received

USD million	31.12.19	31.12.18
Fair value of assets received that can be sold or repledged	475,726	483,688
received as collateral under reverse repurchase, securities borrowing and lending arrangements, derivative and other transactions[1]	*466,045*	*473,302*
received in unsecured borrowings	*9,681*	*10,385*
Thereof sold or repledged[2]	351,327	356,752
in connection with financing activities	*306,212*	*315,402*
to satisfy commitments under short sale transactions	*30,591*	*28,949*
in connection with derivative and other transactions[1]	*14,524*	*12,400*

1 Includes securities received as initial margin from its clients that UBS AG is required to remit to central counterparties, brokers and deposit banks through its exchange-traded derivative clearing and execution services. 2 Does not include off-balance sheet securities (31 December 2019: USD 19.6 billion; 31 December 2018: USD 24.5 billion) placed with central banks related to undrawn credit lines and for payment, clearing and settlement purposes for which there are no associated liabilities or contingent liabilities.

Note 27 Maturity analysis of financial liabilities

The contractual maturities for non-derivative and non-trading financial liabilities as of 31 December 2019 are based on the earliest date on which UBS could be contractually required to pay. The total amounts that contractually mature in each time band are also shown for 31 December 2018. Derivative positions and trading liabilities, predominantly made up of short sale transactions, are assigned to the column *Due within 1 month,* as this provides a conservative reflection of the nature of these trading activities. The contractual maturities may extend over significantly longer periods.

Maturity analysis of financial liabilities

	31.12.19					
USD billion	Due within 1 month	Due between 1 and 3 months	Due between 3 and 12 months	Due between 1 and 5 years	Due after 5 years	Total
Financial liabilities recognized on balance sheet[1]						
Amounts due to banks	5.4	0.3	0.4	0.5	0.0	6.6
Payables from securities financing transactions	7.4	0.1	0.3		0.0	7.8
Cash collateral payables on derivative instruments	31.4					31.4
Customer deposits	423.9	16.5	7.3	3.5	0.0	451.2
Funding from UBS Group AG and its subsidiaries[2]	0.0	0.2	2.3	29.0	24.6	56.2
Debt issued measured at amortized cost[2]	4.3	4.7	27.8	20.7	9.0	66.5
Other financial liabilities measured at amortized cost	5.2	0.1	0.5	1.9	2.0	9.6
of which: lease liabilities	*0.1*	*0.1*	*0.5*	*1.9*	*2.0*	*4.5*
Total financial liabilities measured at amortized cost	477.6	22.0	38.5	55.6	35.6	629.3
Financial liabilities at fair value held for trading[3,4]	30.6					30.6
Derivative financial instruments[3]	120.9					120.9
Brokerage payables designated at fair value	37.2					37.2
Debt issued designated at fair value[5]	21.3	17.4	9.5	12.7	7.1	68.0
Other financial liabilities designated at fair value	34.0	0.4	0.5	0.4	0.9	36.1
Total financial liabilities measured at fair value through profit or loss	244.0	17.8	9.9	13.1	8.0	292.9
Total	721.6	39.9	48.4	68.7	43.6	922.2
Guarantees, commitments and forward starting transactions[6]						
Loan commitments[7]	33.1	0.5	0.3	0.0		33.9
Guarantees[7]	19.1					19.1
Forward starting transactions						
Reverse repurchase agreements[7]	21.9		0.0			21.9
Securities borrowing agreements						0.0
Total	74.1	0.5	0.3	0.0	0.0	74.9

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Note 27 Maturity analysis of financial liabilities (continued)

	31.12.18					
USD billion	Due within 1 month	Due between 1 and 3 months	Due between 3 and 12 months	Due between 1 and 5 years	Due after 5 years	Total
Financial liabilities recognized on balance sheet[1]						
Amounts due to banks	7.9	1.0	1.6	0.5	0.0	11.0
Payables from securities financing transactions	9.5	0.6	0.3		0.0	10.4
Cash collateral payables on derivative instruments	28.9					28.9
Customer deposits	396.6	13.4	6.9	5.1	0.0	422.1
Funding from UBS Group AG and its subsidiaries[2]	0.0	0.0	0.5	21.9	22.0	44.4
Debt issued measured at amortized cost[2]	4.6	5.8	39.1	34.7	12.4	96.5
Other financial liabilities measured at amortized cost	6.4					6.4
Total financial liabilities measured at amortized cost	453.9	20.8	48.4	62.3	34.3	619.7
Financial liabilities at fair value held for trading[3,4]	29.0					29.0
Derivative financial instruments[3]	125.7					125.7
Brokerage payables designated at fair value	38.4					38.4
Debt issued designated at fair value[5]	15.7	18.1	10.2	7.4	8.0	59.4
Other financial liabilities designated at fair value	30.0	0.4	1.1	1.2	1.0	33.7
Total financial liabilities measured at fair value through profit or loss	238.8	18.5	11.3	8.6	9.0	286.2
Total	**692.7**	**39.3**	**59.7**	**70.9**	**43.3**	**905.9**
Guarantees, commitments and forward starting transactions[6]						
Loan commitments[7]	34.1	0.3	0.3	0.0		34.7
Guarantees[7]	19.8					19.8
Forward starting transactions						
Reverse repurchase agreements[7]	9.0		0.0			9.0
Securities borrowing agreements	0.0					0.0
Total	**62.9**	**0.3**	**0.4**	**0.0**	**0.0**	**63.6**

1 Except for financial liabilities at fair value held for trading and derivative financial instruments (see footnote 3), the amounts presented generally represent undiscounted cash flows of future interest and principal payments. 2 The time bucket Due after 5 years includes perpetual loss-absorbing additional tier 1 capital instruments. 3 Carrying amount is fair value. Management believes that this best represents the cash flows that would have to be paid if these positions had to be settled or closed out. Refer to Note 28 for undiscounted cash flows of derivatives designated in hedge accounting relationships. 4 Contractual maturities of financial liabilities at fair value held for trading are: USD 30 billion due within 1 month (2018: USD 28.3 billion), USD 0.6 billion due between 1 month and 1 year (2018: USD 0.6 billion) and USD 0 billion due between 1 and 5 years (2018: USD 0 billion). 5 Future interest payments on variable-rate liabilities are determined by reference to the applicable interest rate prevailing as of the reporting date. Future principal payments that are variable are determined by reference to the conditions existing at the reporting date. 6 Comprises the maximum irrevocable amount of guarantees, commitments and forward starting transactions. 7 Loan commitments measured at fair value of USD 6.3 billion (2018: USD 3.5 billion), guarantees measured at fair value of USD 1.0 billion (2018: USD 1.6 billion) and forward starting reverse repurchase agreements measured at fair value of USD 20.3 billion (2018: USD 8.1 billion) are under the time bucket Due within 1 month.

Note 28 Hedge accounting

Derivatives transacted for hedging purposes

UBS AG enters into derivative transactions for the purpose of hedging risks inherent in assets, liabilities and forecast transactions. The accounting treatment of hedge transactions varies according to the nature of the instrument hedged and whether the hedge qualifies as such for accounting purposes.

Derivative transactions that qualify and are designated as hedges for accounting purposes are described under the corresponding risk category headings in this Note (interest rate risk hedge accounting and structural foreign exchange risk hedge accounting). In addition, UBS AG designates certain non-derivative financial assets and liabilities as hedging instruments in structural foreign exchange risk hedge accounting, as described under the corresponding risk category headings of this Note.

UBS AG has also executed various hedging strategies utilizing derivatives for which hedge accounting has not been applied. These economic hedges include interest rate swaps and other interest rate derivatives (e.g., futures) for day-to-day economic interest rate risk management purposes. In addition, UBS AG has used equity futures, options and, to a lesser extent, swaps in a variety of equity trading strategies to offset underlying equity and equity volatility exposure. UBS AG has also entered into credit default swaps that provide economic hedges for credit risk exposures (refer to "Credit derivatives" in Note 11). UBS AG's accounting policies for derivatives designated and accounted for as hedging instruments or economic hedges that do not qualify for hedge accounting are described in Note 1a item 3j, where terms used in the following sections are explained.

Note 28 Hedge accounting (continued)

Interest rate risk hedge accounting

Fair value hedges: interest rate risk related to debt instruments
UBS AG issues various long-term, fixed-rate debt instruments measured at amortized cost, such as senior unsecured debt, covered bonds and subordinated debt, that are exposed to changes in fair value due to movements in market interest rates. Interest rate swaps are used as fair value hedges to protect against changes in the fair value of the issued debt.

Fair value hedges of interest rate risk related to debt instruments involve swapping fixed cash flows associated with the debt issued to floating cash flows by entering into interest rate swaps that receive fixed and pay floating cash flows. The variable future cash flows are based on the following benchmark rates: USD LIBOR, CHF LIBOR, EURIBOR, GBP LIBOR, AUD LIBOR, JPY LIBOR and SGD LIBOR.

The issued debt and interest rate swaps are designated in a fair value hedge relationship. The notional of the designated hedging instrument matches the notional of the hedged item.

The hedged risk is determined as the change in the fair value of the debt issued arising solely from changes in the designated benchmark interest rate (e.g., one-month or three-month LIBOR). Such change is usually the largest component of the overall change in the fair value of the hedged position in transaction currency.

Hedge effectiveness is assessed by comparing changes in the fair value of the debt issued attributable to changes in the designated benchmark interest rate with the changes in the fair value of the interest rate swaps.

Hedge ineffectiveness can arise from different curves used for the discounting of the hedging instruments and the hedged items, or from mismatches of critical terms between fixed-term lending products and hedging interest rate swaps.

Hedging instruments and hedged items

USD million	31.12.19	31.12.18
Hedging instruments: interest rate swaps		
Nominal amount	65,257	63,816
Carrying amount		
Derivative financial assets	33	27
Derivative financial liabilities		1
Hedged items: debt issued measured at amortized cost		
Carrying amount	26,120	28,139
of which: accumulated amount of fair value hedge adjustment	574	282
Hedged items: funding from UBS Group AG and its subsidiaries		
Carrying amount	41,258	35,647
of which: accumulated amount of fair value hedge adjustment	*525*	*(580)*

Hedge ineffectiveness

	For the year ended		
USD million	31.12.19	31.12.18	31.12.17
Changes in fair value of hedging instruments	1,427	(341)	(16)
Changes in fair value of hedged items	(1,408)	329	(4)
Net gains / (losses) related to hedge ineffectiveness recognized in Other net income from financial instruments measured at fair value through profit or loss	19	(11)	(20)

Profile of the timing of the nominal amount of the hedging instrument

	31.12.19					
USD billion	Due within 1 month	Due between 1 and 3 months	Due between 3 and 12 months	Due between 1 and 5 years	Due after 5 years	Total
Interest rate swaps		3	9	40	14	65

	31.12.18					
USD billion	Due within 1 month	Due between 1 and 3 months	Due between 3 and 12 months	Due between 1 and 5 years	Due after 5 years	Total
Interest rate swaps			4	43	17	64

Note 28 Hedge accounting (continued)

Fair value hedges: portfolio interest rate risk related to loans

UBS AG has a portfolio of long-term fixed-rate mortgage loans in CHF that are measured at amortized cost and exposed to changes in the fair value attributable to movements in market interest rates. Interest rate swaps that pay a fixed rate of interest and receive a floating rate of interest are used as fair value hedges to protect against changes in the fair value of the originated loans.

The portfolio of mortgage loans and interest rate swaps are designated in a fair value hedge relationship. The notional of the designated hedging instrument matches the notional of the hedged item.

The hedging strategy involves an open portfolio of hedged items, i.e., mortgage loans. Both the hedged items and the hedging instruments are adjusted on a monthly basis to reflect changes in size and the maturity profile of the hedged portfolio. The existing hedging relationship is discontinued and a new one is designated. Changes in the portfolio are driven by new loans originated or existing loans repaid.

The hedged risk is determined as the change in the fair value of the loans arising solely from changes in the designated benchmark interest rate (e.g., one-month or three-month LIBOR). Such change is usually the largest component of the overall change in the fair value of the hedged position in transaction currency.

Hedge effectiveness is assessed by comparing changes in the fair value of the hedged portfolio of loans attributable to changes in the designated benchmark interest rate with the changes in the fair value of the interest rate swaps.

Hedge ineffectiveness can arise from different curves used for the discounting of the hedging instruments and the hedged items, or from mismatches of critical terms between fixed-term lending products and hedging interest rate swaps.

Hedging instruments and hedged items

USD million	31.12.19	31.12.18
Hedging instruments: interest rate swaps		
Nominal amount	4,493	10,318
Carrying amount		
Derivative financial assets		0
Derivative financial liabilities	14	31
Hedged items: loans and advances to customers		
Carrying amount	4,494	10,299
of which: accumulated amount of fair value hedge adjustment on the portfolio that was subject to hedge accounting [1]	*117*	*200*
of which: accumulated amount of fair value hedge adjustment, subject to amortization attributable to the portion of the portfolio that ceased to be part of hedge accounting [1]	*172*	*89*

1 Amounts presented within Other financial assets measured at amortized cost and Other financial liabilities measured at amortized cost.

Hedge ineffectiveness

	For the year ended		
USD million	31.12.19	31.12.18	31.12.17
Changes in fair value of hedging instruments[1]	(38)	(22)	(10)
Changes in fair value of hedged items[1]	32	16	3
Net gains / (losses) related to hedge ineffectiveness recognized in Other net income from financial instruments measured at fair value through profit or loss	(6)	(6)	(7)

1 For the year ended 31 December 2017, the amounts included offsetting accrued interest, which had no effect on net gains / (losses) related to hedge ineffectiveness.

Note 28 Hedge accounting (continued)

Cash flow hedges of forecast transactions

UBS AG is exposed to variability in future interest cash flows on non-trading financial assets and liabilities that bear interest at variable rates or are expected to be refinanced or reinvested in the future, due to movements in future market rates. The amounts and timing of future cash flows, representing both principal and interest flows, are projected on the basis of contractual terms and other relevant factors, including estimates of prepayments and defaults. The aggregate principal balances and interest cash flows across all portfolios over time form the basis for identifying the non-trading interest rate risk of UBS AG, which is hedged with interest rate swaps, the maximum maturity of which is 10 years.

UBS AG of forecast cash flows and interest rate swaps are designated in cash flow hedge relationships. The notional of the designated hedging instrument matches the notional of the hedged item for newly transacted swaps. For swaps that are re-designated, the ratio of the designation is determined based on the swap sensitivity.

The hedging strategy involves designation of each interest rate swap in a separate hedge relationship against a group of hedged items that share the same risk. The hedged items giving rise to the hedged cash flows are fungible and could be substituted for each other over the lifetime of the hedge. Cash flow forecasts and risk exposures are monitored and adjusted on an ongoing basis, and consequently hedging instruments are added or taken out of the program accordingly.

The hedged risk is determined as the variability of future cash flows arising solely from changes in the designated benchmark interest rate, i.e., overnight index swap rate / one-month or three-month LIBOR. Hedge effectiveness is assessed by comparing changes in the fair value of the hedged cash flows attributable to changes in the designated benchmark interest rate with the changes in the fair value of the interest rate swaps.

Hedge ineffectiveness can arise from differences in the reference index of the hedging instruments and hedged items, or from inception of the hedge relationship after the trade date of the hedging derivative.

Hedging instruments

USD million	31.12.19	31.12.18
Hedging instruments: interest rate swaps		
Nominal amount	69,443	70,149
Carrying amount		
Derivative financial assets	16	24
Derivative financial liabilities		1

Hedge ineffectiveness

	For the year ended		
USD million	31.12.19	31.12.18	31.12.17
Changes in fair value of hedging instruments[1]	1,639	97	
Changes in fair value of hedged items[1]	(1,571)	(73)	
Effective portion of changes in fair value of hedging instruments recognized as Other comprehensive income	1,571	(42)	45
Ineffectiveness recognized as Other net income from financial instruments measured at fair value through profit or loss	68	25	8

1 This Note addresses the requirement of IFRS 7 effective from 1 January 2018, for which data is provided prospectively.

Other comprehensive income recognized directly in equity related to cash flow hedges

USD million	2019	2018	2017
Balance at the beginning of the year	109	360	955
Effective portion of changes in fair value of hedging instruments recognized in OCI	1,571	(42)	45
Amount reclassified to Net interest income when the hedged item affected profit / (loss), for the year ended 31 December	(175)	(294)	(843)
of which: reclassified to interest income on amortized-cost instruments[1]	*(175)*	*(293)*	
of which: reclassified to interest income on FVTPL instruments[1]	*0*	*(1)*	
Translation effects recognized directly in retained earnings	9	18	39
Income tax related to cash flow hedges	(253)	67	163
Balance at the end of the year	1,260	109	360
of which: related to hedging relationships for which hedge accounting continues to be applied[1,2]	*1,596*	*74*	
of which: related to hedging relationships for which hedge accounting is no longer applied[1,2]	*(43)*	*73*	

1 This Note addresses the requirement of IFRS 7 effective from 1 January 2018, for which data is provided prospectively. 2 Amounts are disclosed on a pre-tax basis.

Structural foreign exchange risk hedge accounting

Hedges of net investments in foreign operations

UBS AG applies hedge accounting for certain net investments in foreign operations. For this purpose, foreign exchange (FX) derivatives, mainly FX forwards and FX swaps, as well as non-derivative financial assets or liabilities are used and designated as hedging instruments. The notional of the designated hedging instrument matches the notional of the hedged item.

Based on UBS AG's risk management strategy, the hedges are adjusted on at least a monthly basis to reflect the changes in the hedged position.

The hedged risk is determined as the change in the carrying amount of net assets of foreign operations arising solely from changes in spot foreign exchange rates. Consequently, UBS AG only designates the spot element of the FX forwards as hedging instruments. Changes in the fair value of the hedging instruments attributable to changes in forward points and the effect of discounting are not part of a hedge accounting designation. These amounts, therefore, do not form part of the effectiveness assessment and are recognized directly in profit or loss.

The effective portion of gains and losses of these FX swaps, i.e., the spot element, is transferred directly to OCI to offset foreign currency translation (FCT) gains and losses on the net investments in foreign branches and subsidiaries. As such, these FX swaps hedge the structural FX exposure, resulting in the accumulation of FCT movements at the level of individual foreign branches and subsidiaries, which make up the total FCT OCI of UBS AG.

When UBS AG designates as hedging instruments certain non-derivative foreign currency financial assets and liabilities of foreign branches or subsidiaries, the FX translation difference recorded in FCT OCI of the non-derivative hedging instrument of one foreign entity offsets the structural FX exposure of another foreign entity. Therefore, the aggregated FCT OCI of UBS AG is unchanged from this hedge designation.

Due to the fact that only the spot element of hedging instruments is designated in hedging relationships, ineffectiveness is unlikely unless the hedged net assets fall below the designated hedged amount. The exceptions are hedges where the hedging currency is not the same as the currency of the foreign operation, where the currency basis may cause ineffectiveness.

Hedging instruments

USD million	31.12.19	31.12.18
Hedging instruments: derivative financial instruments		
Nominal amount	11,875	11,432
Carrying amount		
Derivative financial assets	9	56
Derivative financial liabilities	170	45
Hedging instruments: non-derivative foreign currency assets and liabilities		
Nominal amount	217	229
Carrying amount		
Receivables from securities financing transactions	109	115
Payables from securities financing transactions	109	115

Hedge ineffectiveness

	For the year ended	
USD million	31.12.19	31.12.18
Changes in fair value of hedging instruments	(153)	199
Changes in fair value of hedged items	144	(199)
Effective portion of changes in fair value of hedging instruments recognized in Foreign currency translation OCI	(144)	181
Ineffectiveness recognized as Other net income from financial instruments measured at fair value through profit or loss	(8)	18

Note 28 Hedge accounting (continued)

Foreign currency translation reserve

USD million	31.12.19	31.12.18	31.12.17
Foreign currency translation reserve	4,032	3,940	4,455
of which: effective portion of changes in fair value of hedging instruments related to investment in subsidiaries [1]	*634*	*770*	
of which: for which hedge accounting continues to be applied [1]	*377*	*515*	
of which: for which hedge accounting is no longer applied [1]	*257*	*255*	
Effective portion of changes in fair value of hedging instruments reclassified to Other income upon disposal of investment for the year ended[1]	(14)	2	

1 This Note addresses the requirement of IFRS 7 effective from 1 January 2018, for which data is provided prospectively.

Undiscounted cash flows

The table below provides undiscounted cash flow information for derivative instruments designated in hedge accounting relationships.

Derivatives designated in hedge accounting relationships (undiscounted cash flows)

	2019						
USD billion	On demand	Due within 1 month	Due between 1 and 3 months	Due between 3 and 12 months	Due between 1 and 5 years	Due after 5 years	Total
Interest rate swaps[1]							
FX swaps / forwards							
Cash inflows		6	5	0			11
Cash outflows		6	5	0			11
Net cash flows		0	0	0			0

	2018						
USD billion	On demand	Due within 1 month	Due between 1 and 3 months	Due between 3 and 12 months	Due between 1 and 5 years	Due after 5 years	Total
Interest rate swaps[1]							
FX swaps / forwards							
Cash inflows		9	2				11
Cash outflows		9	2				11
Net cash flows		0	0				0

1 Undiscounted cash inflows and cash outflows of interest rate swaps were not material as the majority of interest rate swaps designated in hedge accounting relationships are legally settled on a daily basis.

Interest rate benchmark reform

As of 1 October 2019, UBS AG early adopted the amendments to IAS 39 and IFRS 7 related to interest rate benchmark reform published by the IASB in September 2019.

The significant interest rate benchmarks to which UBS AG's hedging relationships are exposed are stated in the "Interest rate risk hedge accounting" section of this Note.

UBS AG established a cross-divisional, cross-regional governance structure and change program to address the scale and complexity of the transition to alternative reference rates (ARRs).

As all fair value hedges are directly affected by the interest rate benchmark reform, the relief is applied to all of the disclosed fair value hedges in this Note.

Hedges of net investments in foreign operations are not affected by the amendments.

UBS AG also applies the amendments to those cash flow hedge relationships where the hedged risk is LIBOR. The following table provides details on the nominal amount and carrying amount of the hedging instruments in those hedging relationships.

Cash flow hedges of forecast transactions referencing LIBOR

USD million	31.12.19
Hedging instruments: interest rate swaps	
Nominal amount	16,462
Carrying amount	
Derivative financial assets	0
Derivative financial liabilities	0

Note 29 Pension and other post-employment benefit plans

The table below provides a breakdown of expenses related to pension and other post-employment benefit plans recognized in the income statement within *Personnel expenses*.

Income statement – expenses related to pension and other post-employment benefit plans

USD million	31.12.19	31.12.18	31.12.17
Net periodic expenses for defined benefit plans	291	140	365
of which: related to major pension plans [1]	*271*	*141*	*354*
of which: Swiss plan [2]	*248*	*108*	*307*
of which: UK plan	*3*	*11*	*15*
of which: US and German plans	*21*	*22*	*31*
of which: related to post-employment medical insurance plans [3]	*2*	*(11)*	*3*
of which: related to remaining plans and other expenses [4]	*17*	*10*	*8*
Expenses for defined contribution plans[5]	278	223	236
of which: UK plans	*34*	*35*	*65*
of which: US plan	*173*	*127*	*110*
of which: remaining plans	*71*	*61*	*61*
Total pension and other post-employment benefit plan expenses[6]	569	363	601

1 Refer to Note 29a for more information. 2 Changes to the Swiss pension plan in 2018 resulted in a pre-tax gain of USD 132 million related to past service. Refer to Note 29a for more information on these changes. 3 Refer to Note 29b for more information. 4 Other expenses include differences between actual and estimated performance award accruals. 5 Refer to Note 29c for more information. 6 Refer to Note 6.

The table below provides a breakdown of amounts recognized in *Other comprehensive income* for defined benefit plans.

Other comprehensive income – gains / (losses) on defined benefit plans

USD million	31.12.19	31.12.18	31.12.17
Major pension plans[1]	(128)	(79)	276
of which: Swiss plan	*(15)*	*(201)*	*(56)*
of which: UK plan	*(78)*	*130*	*304*
of which: US and German plans	*(35)*	*(8)*	*28*
Post-employment medical insurance plans[2]	(3)	7	1
Remaining plans	1	3	31
Gains / (losses) recognized in other comprehensive income, before tax	(129)	(70)	308
Tax (expense) / benefit relating to defined benefit plans recognized in other comprehensive income	(41)	245	6
Gains / (losses) recognized in other comprehensive income, net of tax[3]	(170)	175	314

1 Refer to Note 29a for more information. 2 Refer to Note 29b for more information. 3 Refer to the "Statement of comprehensive income."

Financial statements

Note 29 Pension and other post-employment benefit plans (continued)

UBS AG recognizes assets and liabilities with respect to defined benefit plans within *Other non-financial assets* and *Other non-financial liabilities*.

As of 31 December 2019 and 31 December 2018, the Swiss pension plan was in a surplus situation. However, a surplus is only recognized on the balance sheet to the extent that it does not exceed the estimated future economic benefit. Since the estimated future economic benefit was zero as of 31 December 2019 and 31 December 2018, no net defined benefit pension asset was recognized on the balance sheet.

The table below provides a breakdown of the assets and liabilities recognized on the balance sheet within *Other non-financial assets and Other non-financial liabilities* related to defined benefit plans.

Balance sheet – net defined benefit pension and post-employment asset

USD million	31.12.19	31.12.18
Major pension plans[1]	9	0
of which: Swiss plan	*0*	*0*
of which: UK plan	*4*	*0*
of which: US and German plans	*5*	*0*
Total net defined benefit pension and post-employment asset[2]	9	0

1 Refer to Note 29a for more information. 2 Refer to Note 17.

Balance sheet – net defined benefit pension and post-employment liability

USD million	31.12.19	31.12.18
Major pension plans[1]	527	671
of which: Swiss plan	*0*	*0*
of which: UK plan	*0*	*160*
of which: US and German plans[2]	*527*	*511*
Post-employment medical insurance plans[3]	62	62
Remaining plans	40	40
Total net defined benefit pension and post-employment liability[4]	629	773

1 Refer to Note 29a for more information. 2 Of the total liability recognized as of 31 December 2019, USD 111 million related to US plans and USD 416 million related to German plans (31 December 2018: USD 137 million and USD 374 million, respectively). 3 Refer to Note 29b for more information. 4 Refer to Note 22.

a) Defined benefit pension plans

UBS AG has established defined benefit pension plans for its employees in various jurisdictions in accordance with local regulations and practices. The major plans are located in Switzerland, the UK, the US and Germany. The plans' benefits include retirement, disability and survivor benefits. The level of benefits provided depends on the specific plan rules and the level of employee compensation.

The overall investment policy and strategy for UBS AG's defined benefit pension plans is guided by the objective of achieving an investment return that, together with contributions, is intended to ensure that there will be sufficient assets to pay pension benefits as they fall due, while also mitigating various risks. For the plans with assets, i.e., funded plans, the investment strategies are managed under local laws and regulations in each jurisdiction. The asset allocation is determined by the governance body with reference to the current and expected economic and market conditions and in consideration of specific asset class risk in the risk profile. Within this framework, UBS AG ensures that the fiduciaries consider how the asset investment strategy correlates with the maturity profile of the plan liabilities and the respective potential effect on the funded status of the plans, including potential short-term liquidity requirements.

The defined benefit obligations (DBOs) for all of UBS AG's defined benefit pension plans are directly affected by changes in yields of high-quality corporate bonds quoted in an active market in the currency of the respective pension plan, as the applicable discount rate used to determine the DBO is based on these yields. For the funded plans, the pension assets are invested in a diversified portfolio of financial assets, including real estate, bonds, investment funds and cash, across geographic regions, to achieve a balance of risk and return. Under IFRS, volatility arises in each pension plan's net asset / liability position because the fair value of the plan's financial assets is not fully correlated to movements in the value of the plan's DBO. Specific asset-liability matching strategies for each pension plan are independently determined by the responsible governance body. The net asset / liability volatility for each plan is dependent on the specific financial assets chosen by each plan's governance body. For certain pension plans, a liability-driven investment approach is applied to a portion of the plan assets to reduce potential volatility. UBS AG's general principle is to ensure that the plans are adequately funded on the basis of actuarial valuations. Local pension regulations are the primary drivers for determining when contributions are required.

Note 29 Pension and other post-employment benefit plans (continued)

Swiss pension plan

The Swiss pension plan covers employees of UBS AG and employees of companies having close economic or financial ties with UBS AG, and exceeds the minimum benefit requirements under Swiss pension law.

In 2017, a significant number of employees transferred from UBS AG to UBS Business Solutions AG, which is a directly held subsidiary of UBS Group AG. There continues to be one pooled pension plan in Switzerland covering the employees of UBS AG and those transferred to UBS Business Solutions AG. UBS AG and UBS Business Solutions AG both are legal sponsors of UBS's Swiss pension plan. Since the date of the employee transfer, UBS AG and UBS Business Solutions AG apply proportionate defined benefit accounting, i.e., the net pension cost, any OCI impacts from remeasurements and the net pension asset / liability of the Swiss pension plan are allocated proportionally between UBS AG and UBS Business Solutions AG based on the aggregated net pension cost and defined benefit obligations related to their employees.

Contributions to the pension plan are paid by both the employer and the employees. The Swiss pension plan allows employees to choose the level of contributions paid by them. Employee contributions are calculated as a percentage of the contributory salary and are deducted monthly. The percentages deducted from salary depend on age and choice of contribution category and vary between 2.5% and 13.5% of contributory base salary and between 0% and 9% of contributory variable compensation. Depending on the age of the employee, UBS AG pays a contribution that ranges between 6.5% and 27.5% of contributory base salary and between 2.8% and 9% of contributory variable compensation. UBS AG also pays risk contributions that are used to finance benefits paid out in the event of death and disability.

The plan benefits include retirement, disability and survivor benefits. The pension plan offers to members at the normal retirement age of 65 a choice between a lifetime pension with or without full restitution and a partial or full lump sum payment. Participants can choose to continue employment and correspondingly remain active members in the pension plan until the age of 70 at the latest or draw early retirement benefits starting from the age of 58. Employees have the opportunity to make additional purchases of benefits to fund early retirement benefits (Plan 58+).

The pension amount payable is a result of the conversion rate applied on the accumulated balance of the individual plan participant's pension account at the retirement date. The accumulated balance of each individual plan participant's pension account is based on credited vested benefits transferred from previous employers, purchases of benefits, and the employee and employer contributions that have been made to the pension account of each individual plan participant, as well as the interest accrued on the accumulated balance. The interest rate accrued is defined annually by the Pension Foundation Board.

Although the Swiss pension plan is based on a defined contribution promise under Swiss pension law, it is accounted for as a defined benefit plan under IFRS, primarily because of the obligation to accrue interest on the pension accounts and the payment of lifetime pension benefits.

The Swiss pension plan is governed by a Pension Foundation Board. The responsibilities of this board are defined by Swiss pension law and by the plan rules. An actuarial valuation under Swiss pension law is performed regularly. According to Swiss pension law, a temporary limited underfunding is permitted. However, should an underfunded situation occur, the Pension Foundation Board is required to take the necessary measures such that full funding can be expected to be restored within a maximum period of 10 years. If a Swiss pension plan were to become significantly underfunded on a Swiss pension law basis, additional employer and employee contributions could be required. In this situation, the risk is shared between employer and employees, and the employer is not legally obliged to cover more than 50% of the additional contributions required. As of 31 December 2019, the Swiss pension plan had a technical funding ratio under Swiss pension law of 127.1% (31 December 2018: 124.2%).

The investment strategy of the Swiss plan is implemented on the basis of a multi-level investment and risk management process and complies with Swiss pension law, including the rules and regulations relating to diversification of plan assets. These rules, among others, specify restrictions on the composition of plan assets; e.g., there is a limit of 50% for investments in equities. The investment strategy of the Swiss plan is aligned with the defined risk budget set out by the Pension Foundation Board. The risk budget is determined on the basis of regularly performed asset and liability management analyses. In order to implement the risk budget, the Swiss plan may use direct investments, investment funds and derivatives. To mitigate foreign currency risk, a specific currency hedging strategy is in place. The Pension Foundation Board strives for a medium- and long-term balance between assets and liabilities.

As of 31 December 2019, the Swiss pension plan was in a surplus situation on an IFRS measurement basis, as the fair value of plan assets exceeded the DBO by USD 2,099 million (31 December 2018: surplus of USD 1,998 million). However, a surplus is only recognized on the balance sheet to the extent that it does not exceed the estimated future economic benefit, which equals the difference between the present value of the estimated future service cost and the present value of the estimated future employer contributions. The maximum future economic benefit is highly variable based on changes in the discount rate. As of both 31 December 2019 and 31 December 2018, the estimated future economic benefit was zero and hence no net defined benefit asset was recognized on the balance sheet. As of 31 December 2019, the difference between the pension plan surplus and the estimated future economic benefit, i.e., the asset ceiling effect, was USD 2,099 million (31 December 2018: USD 1,998 million).

In the fourth quarter of 2019, UBS AG established an enhanced methodology for measuring the estimated future economic benefits available under the Swiss pension plan, which limits the amount of any surplus recognized in accordance with IFRS, i.e., the asset ceiling calculation. Under the revised approach, which will come into effect in the first quarter of 2020, future service cost is measured individually for each future year, considering the individually applicable discount rate. In addition, an enhanced discount curve methodology will be adopted, utilizing the FINMA-published ultimate forward rate, which represents the average long-term historical real rate plus expected inflation over the long-dated periods where discount rates are unobservable. Application of this approach is expected to reduce the sensitivity in the quarterly asset ceiling calculation to short-term interest rates, resulting in lower variability in the calculation and accordingly the resulting recognition / derecognition of the Swiss pension plan surplus in *Other comprehensive income*. No changes have been made to the methodology for measuring the defined benefit obligation.

Changes to the Swiss pension plan

As a result of the effects of continuing low and in some cases negative interest rates, diminished investment return expectations and increasing life expectancy, the pension fund of UBS AG in Switzerland and UBS AG agreed to measures that have taken effect from the start of 2019 to support the long-term financial stability of the Swiss pension fund. As a result, the conversion rate was lowered, the regular retirement age was increased from 64 to 65, employee contributions were increased from a range of 1% and 13.5% of the contributory base salary to a range of 2.5% and 13.5% of the contributory base salary, and savings contributions start from age 20 instead of the previous starting age of 25. Pensions already in payment on 1 January 2019 were not affected by these measures.

To mitigate the effects of the reduction of the conversion rate on future pensions, UBS AG will make a payment to employees' retirement assets in the Swiss pension fund of up to USD 455 million in three installments in 2020, 2021 and 2022.

In accordance with IFRS, these measures led to a reduction in the pension obligation recognized by UBS AG, resulting in a pre-tax gain of USD 132 million in 2018. In addition, 2018 service costs were lower by USD 34 million due to the decrease in benefits. These effects were recognized as a reduction in *Personnel expenses* within the income statement across the business divisions and Corporate Center, with a corresponding effect in *Other comprehensive income*, as the Swiss pension plan was in a surplus situation that could not be recognized due to the IFRS asset ceiling restriction. If the Swiss pension plan remains in an asset ceiling position, the three payments in 2020, 2021 and 2022, adjusted for expected forfeitures, are expected to reduce total equity by USD 391 million, with no effect on the income statement.

The first installment and the regular employer contributions expected to be made to the Swiss pension plan in 2020 are estimated to be USD 143 million and USD 278 million, respectively.

UK pension plan

The UK plan is a career-average revalued earnings scheme, and benefits increase automatically based on UK price inflation. The normal retirement age for participants in the UK plan is 60. Since 2000, the UK plan has been closed to new entrants and, since 2013, pension plan participants are no longer accruing benefits for current or future service. Employees instead participate in the UK defined contribution plan.

The governance responsibility for the UK plan lies jointly with the Pension Trustee Board, which is required under local pension laws, and UBS AG. The employer contributions to the pension fund reflect agreed-upon deficit funding contributions, which are determined on the basis of the most recent actuarial valuation using assumptions agreed by the Pension Trustee Board and UBS AG. In the event of underfunding, UBS AG and the Pension Trustee Board must agree on a deficit recovery plan within statutory deadlines. In 2019, UBS AG made deficit funding contributions of USD 242 million to the UK plan. In 2018, UBS AG did not make any deficit funding contributions.

Note 29 Pension and other post-employment benefit plans (continued)

The plan assets are invested in a diversified portfolio of financial assets. A liability-driven investment approach is applied, as a portion of the plan assets is invested in inflation-indexed bonds that provide a partial hedge against price inflation. If price inflation increases, the DBO is likely to increase by more than the change in the fair value of plan assets, which would result in an increase in the net defined benefit liability. Plan rules and local pension legislation cap the level of inflationary increase that can be applied to plan benefits.

As the plan is obligated to provide guaranteed lifetime pension benefits to plan participants upon retirement, increases in life expectancy will result in an increase in the plan's liabilities. The sensitivity to changes in life expectancy is particularly high in the UK plan as the pension benefits are indexed to price inflation.

As of 31 December 2019, the UK plan was in a surplus situation on an IFRS measurement basis as the fair value of plan assets exceeded the DBO by USD 4 million (31 December 2018: deficit of USD 160 million).

Total contributions expected to be made to the UK defined benefit pension plan in 2020 are estimated at USD 13 million, subject to regular funding reviews during the year.

In addition, UBS AG and the Pension Trustee Board have entered into an arrangement whereby a collateral pool was established to provide security for the pension fund. The value of the collateral pool as of 31 December 2019 was USD 364 million and includes corporate bonds and government-related debt instruments. The Pension Trustee Board and UBS AG may agree adjustments to the collateral pool in the future. The arrangement provides the Pension Trustee Board dedicated access to a pool of assets in the event of UBS AG's insolvency or not paying a required deficit funding contribution.

US pension plans

There are two distinct major defined benefit pension plans in the US, both with a normal retirement age of 65. Since 1998 and 2001, respectively, the plans have been closed to new entrants, who instead can participate in defined contribution plans.

One of the major defined benefit pension plans is a contribution-based plan in which each participant accrues a percentage of salary in a pension account. The pension account is credited annually with interest based on a rate that is linked to the average yield on one-year US government bonds. For the other major defined benefit pension plan, retirement benefits accrue based on the career-average earnings of each individual plan participant. Former employees with vested benefits have the option to take a lump sum payment or a lifetime annuity commencing early or at retirement age.

As required under local state pension laws, both plans have fiduciaries who, together with UBS AG, are responsible for the governance of the plans. UBS AG regularly reviews the contribution strategy for these plans, considering local statutory funding rules and the cost of any premiums that must be paid to the Pension Benefit Guaranty Corporation for having an underfunded plan. In 2019, the contributions made by UBS AG were USD 29 million (2018: USD 42 million).

The plan assets for both plans are invested in a diversified portfolio of financial assets. Each pension plan's fiduciaries are responsible for the investment decisions with respect to the plan assets. Both US plans apply a liability-driven investment approach to support the volatility management in the net asset / liability position. Derivative instruments may be employed to manage volatility.

The employer contributions expected to be made to the US defined benefit pension plans in 2020 are estimated at USD 9 million.

German pension plans

There are two different defined benefit pension plans in Germany, and both are contribution-based plans. No plan assets are set aside to fund these plans, and benefits are paid directly by UBS AG. The normal retirement age for the participants in the German plans is 65. Within the larger of the two plans, each participant accrues a percentage of salary in a pension account. The accumulated account balance of the plan participant is credited on an annual basis with guaranteed interest at a rate of 5%. In the other plan, amounts are accrued annually based on employee elections related to variable compensation. For this plan, the accumulated account balance is credited on an annual basis with a guaranteed interest rate of 6% for amounts accrued before 2010, of 4% for amounts accrued from 2010 to 2017 and of 0.9% for amounts accrued after 2017. Both plans are regulated under German pension law, under which the responsibility to pay pension benefits when they are due rests entirely with UBS AG. For these plans, a portion of the pension payments is directly increased in line with price inflation.

The benefits expected to be paid by UBS AG to the participants of the German plans in 2020 are estimated at USD 10 million.

Financial information by plan

The tables on the following pages provide an analysis of the movement in the net asset / liability recognized on the balance sheet for defined benefit pension plans, as well as an analysis of amounts recognized in net profit and in *Other comprehensive income*.

Note 29 Pension and other post-employment benefit plans (continued)

Defined benefit pension plans

USD million	Swiss plan		UK plan		US and German plans		Total	
	2019	2018	2019	2018	2019	2018	2019	2018
Defined benefit obligation at the beginning of the year	13,774	14,398	3,192	3,744	1,679	1,816	18,645	19,957
Current service cost	243	251	0	0	6	7	249	258
Interest expense	122	93	92	93	59	55	273	241
Plan participant contributions	149	137	0	0	0	0	149	137
Remeasurements	(61)	(263)	361	(266)	185	(69)	485	(598)
of which: actuarial (gains) / losses due to changes in demographic assumptions	*(125)*	*0*	*(26)*	*(18)*	*3*	*(5)*	*(148)*	*(23)*
of which: actuarial (gains) / losses due to changes in financial assumptions	*1,006*	*(391)*	*421*	*(257)*	*179*	*(69)*	*1,605*	*(716)*
of which: experience (gains) / losses [1,2]	*(942)*	*128*	*(34)*	*8*	*4*	*5*	*(972)*	*142*
Past service cost related to plan amendments	0	(132)	0	4	0	0	0	(128)
Curtailments	0	(17)	0	0	0	0	0	(17)
Benefit payments	(624)	(586)	(135)	(202)	(102)	(112)	(860)	(900)
Foreign currency translation	206	(108)	144	(181)	(8)	(18)	342	(307)
Defined benefit obligation at the end of the year	13,809	13,774	3,654	3,192	1,820	1,679	19,283	18,645
of which: amounts owed to active members	*7,073*	*6,380*	*164*	*146*	*235*	*226*	*7,472*	*6,751*
of which: amounts owed to deferred members	*0*	*0*	*1,559*	*1,434*	*675*	*606*	*2,233*	*2,040*
of which: amounts owed to retirees	*6,735*	*7,394*	*1,931*	*1,612*	*911*	*847*	*9,577*	*9,854*
Fair value of plan assets at the beginning of the year	15,772	16,388	3,032	3,469	1,168	1,265	19,972	21,122
Return on plan assets excluding amounts included in interest income[2]	(30)	(434)	284	(136)	150	(77)	403	(647)
Interest income	142	109	89	86	47	44	278	238
Employer contributions	271	308	242	0	38	51	550	360
Plan participant contributions	149	137	0	0	0	0	149	137
Benefit payments	(624)	(586)	(135)	(202)	(102)	(112)	(860)	(900)
Administration expenses, taxes and premiums paid	(7)	(7)	0	0	(2)	(3)	(9)	(10)
Foreign currency translation	235	(144)	146	(185)	0	0	381	(328)
Fair value of plan assets at the end of the year	15,908	15,772	3,658	3,032	1,299	1,168	20,864	19,972
Asset ceiling effect at the beginning of the year	1,998	1,990	0	0	0	0	1,998	1,990
Interest expense on asset ceiling effect	18	14	0	0	0	0	18	14
Asset ceiling effect excluding interest expense and foreign currency translation on asset ceiling effect	46	30	0	0	0	0	46	30
Foreign currency translation	36	(36)	0	0	0	0	36	(36)
Asset ceiling effect at the end of the year	2,099	1,998	0	0	0	0	2,099	1,998
Net defined benefit asset / (liability)	0	0	4	(160)	(521)	(511)	(518)	(671)
Movement in the net asset / (liability) recognized on the balance sheet								
Net asset / (liability) recognized on the balance sheet at the beginning of the year	0	0	(160)	(275)	(511)	(550)	(671)	(825)
Net periodic expenses recognized in net profit	(248)	(108)	(3)	(11)	(21)	(22)	(271)	(141)
Gains / (losses) recognized in other comprehensive income	(15)	(201)	(78)	130	(35)	(8)	(128)	(79)
Employer contributions	271	308	242	0	38	51	550	360
Foreign currency translation	(8)	0	2	(4)	8	18	2	14
Net asset / (liability) recognized on the balance sheet at the end of the year	0	0	4	(160)	(521)	(511)	(518)	(671)
Funded and unfunded plans								
Defined benefit obligation from funded plans	13,809	13,774	3,654	3,192	1,319	1,219	18,782	18,184
Defined benefit obligation from unfunded plans	0	0	0	0	501	460	501	460
Plan assets	15,908	15,772	3,658	3,032	1,299	1,168	20,864	19,972
Surplus / (deficit)	2,099	1,998	4	(160)	(521)	(511)	1,582	1,327
Asset ceiling effect	2,099	1,998	0	0	0	0	2,099	1,998
Net defined benefit asset / (liability)	0	0	4	(160)	(521)	(511)	(518)	(671)

1 Experience (gains) / losses are a component of actuarial remeasurements of the defined benefit obligation that reflect the effects of differences between the previous actuarial assumptions and what has actually occurred. 2 Includes the effect from employees transferring between UBS AG and UBS Business Solutions during the period.

Note 29 Pension and other post-employment benefit plans (continued)

Analysis of amounts recognized in net profit

USD million	Swiss plan		UK plan		US and German plans		Total	
For the year ended	31.12.19	31.12.18	31.12.19	31.12.18	31.12.19	31.12.18	31.12.19	31.12.18
Current service cost	243	251	0	0	6	7	249	258
Interest expense related to defined benefit obligation	122	93	92	93	59	55	273	241
Interest income related to plan assets	(142)	(109)	(89)	(86)	(47)	(44)	(278)	(238)
Interest expense on asset ceiling effect	18	14	0	0	0	0	18	14
Administration expenses, taxes and premiums paid	7	7	0	0	2	3	9	10
Past service cost related to plan amendments	0	(132)	0	4	0	0	0	(128)
Curtailments	0	(17)	0	0	0	0	0	(17)
Net periodic expenses recognized in net profit	248	108	3	11	21	22	271	141

Analysis of amounts recognized in other comprehensive income (OCI)

USD million	Swiss plan		UK plan		US and German plans		Total	
For the year ended	31.12.19	31.12.18	31.12.19	31.12.18	31.12.19	31.12.18	31.12.19	31.12.18
Remeasurement of defined benefit obligation	61	263	(361)	266	(185)	69	(485)	598
Return on plan assets excluding amounts included in interest income	(30)	(434)	284	(136)	150	(77)	403	(647)
Asset ceiling effect excluding interest expense and foreign currency translation on asset ceiling effect	(46)	(30)	0	0	0	0	(46)	(30)
Total gains / (losses) recognized in other comprehensive income, before tax	(15)	(201)	(78)	130	(35)	(8)	(128)	(79)

The table below provides information about the duration of the DBO and the timing for expected benefit payments.

	Swiss plan		UK plan		US and German plans[1]	
	31.12.19	31.12.18	31.12.19	31.12.18	31.12.19	31.12.18
Duration of the defined benefit obligation (in years)	15.2	14.5	20.2	19.5	10.1	9.8
Maturity analysis of benefits expected to be paid						
USD million						
Benefits expected to be paid within 12 months	687	704	93	82	121	108
Benefits expected to be paid between 1 and 3 years	1,383	1,439	209	187	228	216
Benefits expected to be paid between 3 and 6 years	2,048	2,170	384	345	346	336
Benefits expected to be paid between 6 and 11 years	3,232	3,446	748	701	548	566
Benefits expected to be paid between 11 and 16 years	2,899	3,140	807	770	455	494
Benefits expected to be paid in more than 16 years	9,136	10,253	3,913	3,927	721	798

1 The duration of the defined benefit obligation represents a weighted average across US and German plans.

Actuarial assumptions

The measurement of each pension plan's DBO considers different actuarial assumptions. Changes in those assumptions lead to volatility in the DBO. The following significant actuarial assumptions are applied:

- Discount rate: the discount rate is based on the yield of high-quality corporate bonds quoted in an active market in the currency of the respective pension plan. Consequently, a decrease in the yield of high-quality corporate bonds increases the DBO. Conversely, an increase in the yield of high-quality corporate bonds decreases the DBO.
- Rate of salary increase: an increase in the salary of plan participants generally increases the DBO, specifically for the Swiss and German plans. For the UK plan, as the plan is closed for future service, UBS AG employees no longer accrue future service benefits and thus salary increases have no effect on the DBO. For the US plans, only a small percentage of the total population continues to accrue benefits for future service and therefore the effect of a salary increase on the DBO is minimal.
- Rate of pension increase: for the Swiss plan, there is no automatic indexing of pensions. Any increase would be decided by the Pension Foundation Board. For the US plans, there is also no automatic indexing of pensions. For the UK plan, pensions are automatically indexed to price inflation as per plan rules and local pension legislation. The German plans are also automatically indexed and a portion of the pensions are directly increased by price inflation. An increase in price inflation in the UK or Germany increases the respective plan's DBO.
- Rate of interest credit on retirement savings: the Swiss plan and one of the US plans have retirement saving balances that are increased annually by an interest credit rate. For each of these plans, an increase in the interest credit rate increases the plan's DBO.
- Life expectancy: most of UBS AG's defined benefit pension plans are obligated to provide guaranteed lifetime pension benefits. The DBO for all plans is calculated using an underlying best estimate of the life expectancy of plan participants. An increase in the life expectancy of plan participants increases the plan's DBO.

The actuarial assumptions used for the pension plans are based on the economic conditions prevailing in the jurisdiction in which they are offered.

→ **Refer to Note 1a item 7 for a description of the accounting policy for defined benefit pension plans**

Changes in actuarial assumptions

UBS AG regularly reviews the actuarial assumptions used in calculating its DBO to determine their continuing relevance.

Swiss pension plan

In 2019, a net gain of USD 61 million was recognized in *Other comprehensive income* (OCI) related to the remeasurement of the DBO. This was primarily due to experience gains of USD 942 million, reflecting differences between the previous actuarial assumptions and what actually occurred, USD 149 million resulting from a decrease in the expected rate of interest credit on retirement savings, USD 65 million due to an update in the disability assumption and USD 60 million due to an update in the turnover assumption. This effect was partly offset by a market-driven decrease in the discount rate, which resulted in an OCI loss of USD 1,156 million.

In 2018, a net gain of USD 263 million was recognized in OCI related to the remeasurement of the DBO. This was primarily due to a market-driven increase in the discount rate, which resulted in an OCI gain of USD 478 million. This effect was partially offset by experience losses of USD 128 million, reflecting differences between the previous actuarial assumptions and what actually occurred, and market-driven changes to the assumed rate of interest credit on retirement savings, which resulted in a loss of USD 77 million. Changes in other assumptions were not significant.

UK pension plan

In 2019, a loss of USD 361 million was recognized in OCI related to the remeasurement of the DBO for the UK plan. This was primarily due to a market-driven decrease in the discount rate, which resulted in an OCI loss of USD 552 million. This loss was partially offset by a gain of USD 132 million due to a decrease in the expected rate of pension increase, experience gains of USD 34 million which reflect differences between the previous actuarial assumptions and what actually occurred, and a gain of USD 21 million due to an update of the mortality improvement assumption.

In 2018, a net gain of USD 266 million was recognized in OCI related to the remeasurement of the DBO for the UK plan. This was primarily due to a market-driven increase in the discount rate, which resulted in an OCI gain of USD 219 million, as well as changes in the pension increase assumption, which resulted in an OCI gain of USD 37 million.

US and German pension plans

In 2019, a loss of USD 185 million was recognized in OCI related to the remeasurement of the DBO for the US and German plans, compared with a net gain of USD 69 million in 2018. OCI gains and losses in both years were primarily driven by market-driven movements in discount rates.

Note 29 Pension and other post-employment benefit plans (continued)

The tables below show the significant actuarial assumptions used in calculating the DBO at the end of the year.

Significant actuarial assumptions

	Swiss plan		UK plan		US and German plans[1]	
In %	31.12.19	31.12.18	31.12.19	31.12.18	31.12.19	31.12.18
Discount rate	0.29	0.92	2.07	2.90	2.58	3.69
Rate of salary increase	1.50	1.50	0.00	0.00	2.37	2.81
Rate of pension increase	0.00	0.00	2.92	3.10	1.80	1.50
Rate of interest credit on retirement savings	0.49	0.92	0.00	0.00	2.57	3.70

1 Represents weighted average assumptions across US and German plans.

Mortality tables and life expectancies for major plans

		Life expectancy at age 65 for a male member currently			
		aged 65		aged 45	
Country	Mortality table	31.12.19	31.12.18	31.12.19	31.12.18
Switzerland	BVG 2015 G with CMI 2016 projections	21.6	21.6	23.1	23.1
UK	S2PA with CMI 2018 projections[1]	23.3	23.4	24.5	24.6
USA	RP2014 WCHA with MP2019 projection scale[2]	22.8	22.8	24.3	24.3
Germany	Dr. K. Heubeck 2018 G	20.7	20.5	23.5	23.3

		Life expectancy at age 65 for a female member currently			
		aged 65		aged 45	
Country	Mortality table	31.12.19	31.12.18	31.12.19	31.12.18
Switzerland	BVG 2015 G with CMI 2016 projections	23.6	23.5	25.1	25.0
UK	S2PA with CMI 2018 projections[1]	25.1	25.2	26.4	26.5
USA	RP2014 WCHA with MP2019 projection scale[2]	24.4	24.4	25.9	26.0
Germany	Dr. K. Heubeck 2018 G	24.2	24.1	26.4	26.3

1 In 2018, the mortality table S2PA with CMI 2017 projections was used. 2 In 2018, the mortality table RP2014 WCHA with MP2018 projection scale was used.

Sensitivity analysis of significant actuarial assumptions

The table below presents a sensitivity analysis for each significant actuarial assumption, showing how the DBO would have been affected by changes in the relevant actuarial assumption that were reasonably possible at the balance sheet date. Unforeseen circumstances may arise, which could result in variations that are outside the range of alternatives deemed reasonably possible. Caution should be used in extrapolating the sensitivities below on the DBO as the sensitivities may not be linear.

Sensitivity analysis of significant actuarial assumptions[1]

Increase / (decrease) in defined benefit obligation	Swiss plan		UK plan		US and German plans	
USD million	31.12.19	31.12.18	31.12.19	31.12.18	31.12.19	31.12.18
Discount rate						
Increase by 50 basis points	(853)	(797)	(346)	(292)	(86)	(77)
Decrease by 50 basis points	972	904	395	333	93	84
Rate of salary increase						
Increase by 50 basis points	49	45	–[2]	–[2]	1	1
Decrease by 50 basis points	(47)	(43)	–[2]	–[2]	(1)	(1)
Rate of pension increase						
Increase by 50 basis points	673	643	331	260	7	6
Decrease by 50 basis points	–[3]	–[3]	(299)	(262)	(7)	(6)
Rate of interest credit on retirement savings						
Increase by 50 basis points	107	141	–[4]	–[4]	9	9
Decrease by 50 basis points	(62)[5]	(134)	–[4]	–[4]	(9)	(9)
Life expectancy						
Increase in longevity by one additional year	459	446	154	122	51	42

1 The sensitivity analyses are based on a change in one assumption while holding all other assumptions constant, so that interdependencies between the assumptions are excluded. 2 As the plan is closed for future service, a change in assumption is not applicable. 3 As the assumed rate of pension increase was 0% as of 31 December 2019 and as of 31 December 2018, a downward change in assumption is not applicable. 4 As the UK plan does not provide interest credits on retirement savings, a change in assumption is not applicable. 5 As of 31 December 2019, 18.5% of retirement savings were subject to a legal minimum rate of 1.00%.

Note 29 Pension and other post-employment benefit plans (continued)

Fair value of plan assets

The tables below provide information about the composition and fair value of plan assets of the Swiss, the UK and the US pension plans.

Composition and fair value of plan assets

Swiss plan

	31.12.19				31.12.18			
	Fair value			Plan asset allocation %	Fair value			Plan asset allocation %
USD million	Quoted in an active market	Other	Total		Quoted in an active market	Other	Total	
Cash and cash equivalents	90	0	90	1	83	0	83	1
Real estate / property								
Domestic	0	1,720	1,720	11	0	1,808	1,808	11
Foreign	0	90	90	1	0	0	0	0
Investment funds								
Equity								
Domestic	395	0	395	2	383	0	383	2
Foreign	3,433	932	4,365	27	3,492	925	4,417	28
Bonds[1]								
Domestic, AAA to BBB–	1,825	0	1,825	11	1,569	0	1,569	10
Foreign, AAA to BBB–	3,315	0	3,315	21	3,781	0	3,781	24
Foreign, below BBB–	563	0	563	4	544	0	544	3
Real estate								
Foreign	0	0	0	0	0	7	7	0
Other	904	2,230	3,134	20	316	2,528	2,844	18
Other investments	301	109	411	3	324	11	335	2
Total fair value of plan assets	10,827	5,081	15,908	100	10,493	5,279	15,772	100

	31.12.19	31.12.18
Total fair value of plan assets	15,908	15,772
of which:[2]		
Bank accounts at UBS AG	*90*	*80*
UBS AG debt instruments	*4*	*8*
UBS Group AG shares	*12*	*15*
Securities lent to UBS AG[3]	*748*	*957*
Property occupied by UBS AG	*50*	*54*
Derivative financial instruments, counterparty UBS AG[3]	*6*	*21*

1 The bond credit ratings are primarily based on Standard & Poor's credit ratings. Ratings AAA to BBB– and below BBB– represent investment grade and non-investment grade ratings, respectively. In cases where credit ratings from other rating agencies were used, these were converted to the equivalent rating in the Standard & Poor's rating classification. 2 Bank accounts at UBS AG encompass accounts in the name of the Swiss pension fund. The other positions disclosed in the table encompass both direct investments in UBS AG instruments and UBS Group AG shares and indirect investments, i.e., those made through funds that the pension fund invests in. 3 Securities lent to UBS AG and derivative financial instruments are presented gross of any collateral. Securities lent to UBS AG were fully covered by collateral as of 31 December 2019 and 31 December 2018. Net of collateral, derivative financial instruments amounted to USD 3 million as of 31 December 2019 (31 December 2018: USD 6 million).

Note 29 Pension and other post-employment benefit plans (continued)

Composition and fair value of plan assets (continued)

UK plan

	31.12.19				31.12.18			
	Fair value			Plan asset allocation %	Fair value			Plan asset allocation %
USD million	Quoted in an active market	Other	Total		Quoted in an active market	Other	Total	
Cash and cash equivalents	141	0	141	4	143	0	143	5
Bonds[1]								
Domestic, AAA to BBB–	1,810	0	1,810	49	1,604	0	1,604	53
Investment funds								
Equity								
Domestic	33	0	33	1	26	0	26	1
Foreign	916	0	916	25	658	0	658	22
Bonds[1]								
Domestic, AAA to BBB–	610	117	727	20	587	93	680	22
Domestic, below BBB–	22	0	22	1	15	0	15	0
Foreign, AAA to BBB–	310	0	310	8	258	0	258	9
Foreign, below BBB–	108	0	108	3	51	0	51	2
Real estate								
Domestic	103	18	122	3	102	28	131	4
Foreign	0	19	19	1	0	0	0	0
Insurance contracts	0	7	7	0	0	0	0	0
Derivatives	3	0	3	0	0	0	0	0
Asset-backed securities	0	6	6	0	21	2	22	1
Other investments[2]	(572)	7	(565)	(15)	(565)	9	(556)	(18)
Total fair value of plan assets	3,483	175	3,658	100	2,900	132	3,032	100

1 The bond credit ratings are primarily based on Standard & Poor's credit ratings. Ratings AAA to BBB– and below BBB– represent investment grade and non-investment grade ratings, respectively. In cases where credit ratings from other rating agencies were used, these were converted to the equivalent rating in Standard & Poor's rating classification. 2 Mainly relates to repurchase arrangements on UK treasury bonds.

Note 29 Pension and other post-employment benefit plans (continued)

Composition and fair value of plan assets (continued)

US plans

	31.12.19				31.12.18			
	Fair value			Plan asset allocation %	Fair value			Plan asset allocation %
USD million	Quoted in an active market	Other	Total		Quoted in an active market	Other	Total	
Cash and cash equivalents	27	0	27	2	27	0	27	2
Bonds[1]								
Domestic, AAA to BBB–	475	0	475	37	462	0	462	40
Domestic, below BBB–	2	0	2	0	2	0	2	0
Foreign, AAA to BBB–	99	0	99	8	92	0	92	8
Foreign, below BBB–	3	0	3	0	3	0	3	0
Investment funds								
Equity								
Domestic	208	0	208	16	143	0	143	12
Foreign	161	0	161	12	157	0	157	13
Bonds[1]								
Domestic, AAA to BBB–	176	0	176	14	104	0	104	9
Domestic, below BBB–	28	0	28	2	23	0	23	2
Foreign, AAA to BBB–	17	0	17	1	56	0	56	5
Foreign, below BBB–	3	0	3	0	6	0	6	1
Real estate								
Domestic	0	13	13	1	0	13	13	1
Other	69	0	69	5	64	0	64	5
Insurance contracts	0	18	18	1	0	17	17	1
Total fair value of plan assets	1,268	31	1,299	100	1,139	29	1,168	100

1 The bond credit ratings are primarily based on Standard & Poor's credit ratings. Ratings AAA to BBB– and below BBB– represent investment grade and non-investment grade ratings, respectively. In cases where credit ratings from other rating agencies were used, these were converted to the equivalent rating in Standard & Poor's rating classification.

Note 29 Pension and other post-employment benefit plans (continued)

b) Post-employment medical insurance plans

In the US and the UK, UBS AG offers post-employment medical insurance benefits that contribute to the health care coverage of certain employees and their beneficiaries after retirement. The UK post-employment medical insurance plan is closed to new entrants. In the US, retiree medical premiums are subsidized for eligible participants who retired before 2014. These plans are not prefunded.

In 2018, UBS AG announced changes to one of the US post-employment medical insurance plans that replaced the UBS AG retiree medical subsidy with a new subsidy to purchase medical coverage through a private Medicare exchange. This change reduced the post-employment benefit obligation by USD 14 million, resulting in a corresponding gain recognized in the income statement in 2018.

As of 31 December 2019, the net liability recognized for post-employment medical insurance plans was USD 62 million (31 December 2018: USD 62 million). An expense of USD 2 million was recognized in the income statement in 2019 (2018: gain of USD 11 million; 2017: expense of USD 3 million) and a loss of USD 3 million in *Other comprehensive income* in 2019 (2018: gain of USD 7 million; 2017: gain of USD 1 million).

The benefits expected to be paid to participants in 2020 are estimated at USD 5 million.

The measurement of each medical insurance plan's post-employment benefit obligation considers different actuarial assumptions. Reasonably possible changes in actuarial assumptions would not lead to material movements in the net liability recognized as of 31 December 2019 and as of December 2018.

c) Defined contribution plans

UBS AG sponsors a number of defined contribution plans in locations outside Switzerland. The locations with significant defined contribution plans are the US and the UK. Certain plans allow employees to make contributions and earn matching or other contributions from UBS AG. Employer contributions to defined contribution plans are recognized as an expense, which, for 2019, 2018 and 2017, amounted to USD 278 million, USD 223 million and USD 236 million, respectively.

d) Related-party disclosure

UBS AG is the principal provider of banking services for the pension fund of UBS AG in Switzerland. In this capacity, UBS AG is engaged to execute most of the pension fund's banking activities. These activities can include, but are not limited to, trading, securities lending and borrowing and derivative transactions. The non-Swiss UBS AG pension funds do not have a similar banking relationship with UBS AG.

Also, UBS AG leases certain properties that are owned by the Swiss pension fund. As of 31 December 2019, the minimum commitment toward the Swiss pension fund under the related leases was approximately USD 8 million (31 December 2018: USD 10 million).

→ **Refer to the "Composition and fair value of plan assets" table in Note 29a for more information about fair value of investments in UBS AG and UBS Group AG instruments held by the Swiss pension fund**

The following amounts have been received or paid by UBS AG from and to the pension and other post-employment benefit plans located in Switzerland, the UK and the US in respect of these banking activities and arrangements.

Related-party disclosure

	For the year ended		
USD million	31.12.19	31.12.18	31.12.17
Received by UBS AG			
Fees	19	22	36
Paid by UBS AG			
Rent	2	3	5
Dividends, capital repayments and interest	10	10	10

The transaction volumes in UBS Group AG shares and UBS AG debt instruments and the balances of UBS Group AG shares held as of 31 December were:

Transaction volumes – UBS Group AG shares and UBS AG debt instruments

	For the year ended	
	31.12.19	31.12.18
Financial instruments bought by pension funds		
UBS Group AG shares (in thousands of shares)	929	831
UBS AG debt instruments (par values, USD million)	1	9
Financial instruments sold by pension funds or matured		
UBS Group AG shares (in thousands of shares)	1,778	547
UBS AG debt instruments (par values, USD million)	5	2

UBS Group AG shares held by pension and other post-employment benefit plans

	31.12.19	31.12.18
Number of shares (in thousands of shares)	14,991	15,934
Fair value (USD million)	189	197

Note 30 Employee benefits: variable compensation

a) Plans offered

UBS has several share-based and other compensation plans that align the interests of Group Executive Board (GEB) members and other employees with the interests of investors. These compensation plans are also designed to meet regulatory requirements. The most significant compensation plans are described below.

For the majority of variable compensation awards granted under such plans to employees of UBS AG, the grantor entity is UBS Group AG. Expenses associated with these awards are charged by UBS Group AG to UBS AG. For the purpose of this Note, references to shares refer to UBS Group AG shares.

→ **Refer to Note 1a item 6 for a description of the accounting policy related to share-based and other deferred compensation plans**

Mandatory deferred compensation plans

Equity Ownership Plan (EOP)

The EOP is a mandatory deferred share-based compensation plan for all employees with total annual compensation greater than USD / CHF 300,000. Starting with performance year 2019, GEB members, Group Managing Directors (GMDs) and Vice Chairs receive Long-Term Incentive Plan (LTIP) awards instead of EOP.

EOP awards granted to GEB members and GMDs in 2019 and prior years, as well as EOP awards granted to certain other employees, will only vest if both Group and business division performance conditions are met. For awards granted in 2019 and 2020, related to the performance years 2018 and 2019, respectively, the Group performance condition is based on the average reported return on common equity tier 1 capital (RoCET1). For awards granted in 2018 and before, the Group performance condition is based on the average adjusted return on tangible equity (RoTE) excluding deferred tax assets over the performance period. Business division performance is measured on the basis of their average adjusted return on attributed equity (RoAE). For Corporate Center employees, it is measured on the basis of the average operating businesses' adjusted RoAE.

Certain awards, such as replacement awards issued outside the normal performance year cycle, may take the form of deferred cash under the EOP plan rules.

Notional shares represent a promise to receive UBS shares at vesting and do not carry voting rights during the vesting period. Awards granted generally carry a dividend equivalent that may be paid in notional shares or cash and that vests on the same terms and conditions as the awards. However, starting with awards granted in 2018 for the performance year 2017, European Banking Authority guidelines do not permit individuals who are deemed to be Material Risk Takers (MRTs) to receive dividend or interest payments on instruments awarded as deferred variable compensation. Where dividend payments are not permitted, the grant price of the EOP award is adjusted for the expected dividend yield over the vesting period to reflect the fair value of the non-dividend-bearing award.

Awards are settled by delivering UBS shares at vesting, except in jurisdictions where this is not permitted for legal or tax reasons. EOP awards generally vest in equal installments after two and three years following the granting of such awards. Awards granted to GEB members in 2019 and prior years generally vest after three, four and five years. The awards are generally forfeitable upon, among other circumstances, voluntary termination of employment with UBS.

Long-Term Incentive Plan

The LTIP is a mandatory deferred share-based compensation plan for senior leaders of the Group (i.e., GEB members, GMDs and Vice Chairs). LTIP awards are granted for the first time in 2020 as part of the performance award pool for 2019.

The final number of notional shares delivered at vesting depends on two equally weighted performance metrics: average reported return on CET1 capital (RoCET1) and relative total shareholder return (rTSR), which measures UBS's total shareholder return against an index consisting of global systemically important banks as determined by the Financial Stability Board. These performance metrics are separately valued as of the date of grant and (re-)assessed over a three-year performance period starting in the year of grant. For both metrics there is a threshold level, which would result in a 33% payout, and a maximum level, which would result in a 100% payout. Any performance between the threshold and the maximum level would result in a linear payout between 33% and 100%.

The final number of shares as determined at the end of the three-year performance period will vest in three equal installments in each of the three years following the performance period for GEB members, and cliff-vest in the first year following the performance period for GMDs and Vice Chairs. The awards are generally forfeitable upon, among other circumstances, voluntary termination of employment with UBS.

In general, the form of the equity awards (notional shares), the entitlement to dividend equivalents and the settlement method is the same as for EOP awards.

Deferred Contingent Capital Plan (DCCP)

The DCCP is a mandatory deferred compensation plan for all employees with total annual compensation greater than USD / CHF 300,000.

DCCP awards take the form of notional additional tier 1 (AT1) capital instruments, which, at the discretion of UBS, can be settled in either a cash payment or a perpetual, marketable AT1 capital instrument. DCCP awards vest in full after five years, and up to seven years for UK senior management functions, unless there is a trigger event.

Awards are forfeited if a viability event occurs, i.e., if FINMA notifies the firm in writing that the DCCP awards must be written down to prevent an insolvency, bankruptcy or failure of UBS, or if UBS receives a commitment of extraordinary support from the public sector that is necessary to prevent such an event. Additionally, they are also written down if the Group's common equity tier 1 capital ratio falls below 10% for GEB members and below 7% for all other employees. As an additional performance condition, GEB members forfeit 20% of their award for each loss-making year during the vesting period.

Interest payments on DCCP awards are paid at the discretion of UBS. Where interest payments are not permitted, such as for MRTs, the DCCP award reflects the fair value of the granted non-interest-bearing award.

The awards are generally forfeitable upon, among other circumstances, voluntary termination of employment with UBS.

Asset Management EOP

In order to align deferred compensation of certain Asset Management employees with the performance of the investment funds they manage, awards are granted to such employees in the form of cash-settled notional investment funds. The amount delivered depends on the value of the underlying investment funds at the time of vesting. The awards are generally forfeitable upon, among other circumstances, voluntary termination of employment with UBS.

Financial advisor variable compensation

In line with market practice for US wealth management businesses, the compensation for US financial advisors in Global Wealth Management is comprised of production payout and deferred compensation awards. Production payout is primarily based on compensable revenue and is paid monthly.

Financial advisors may also qualify for deferred compensation awards, which generally vest over a six-year period. The awards are based on strategic performance measures, including production, length of service with the firm and net new business. Production payout rates and deferred compensation awards may be reduced for, among other things, errors, negligence or carelessness, or a failure to comply with the firm's rules, standards, practices and policies or applicable laws and regulations.

Strategic objective awards

Strategic objective awards are deferred compensation awards based on strategic performance measures, including production, length of service with the firm and net new business. These awards are granted in the form of both deferred share-based and deferred cash-based awards, with a vesting period of up to six years.

Other compensation plans

Equity Plus Plan (Equity Plus)

Equity Plus is a voluntary share-based compensation plan that provides eligible employees with the opportunity to purchase UBS shares at market value and receive one notional share for every three shares purchased, up to a maximum annual limit. Share purchases may be made annually from the performance award and/or monthly through deductions from salary. If the shares purchased are held until three years from the start of the associated plan year and, in general, if the employee remains employed by UBS, the notional shares vest. Employees are entitled to receive a dividend equivalent which may be paid in notional shares and/or cash.

Role-based allowances (RBA)

Certain employees of legal entities regulated in the EU may receive an RBA in addition to their base salary. This allowance reflects the market value of a specific role and is fixed, non-forfeitable compensation. Unlike salary, an RBA is paid only as long as the employee is in such a role. RBA consist of a cash portion and, where applicable, a blocked UBS share award. Such shares will be unblocked in equal installments after two and three years. The compensation expense is recognized in the year of grant.

Note 30 Employee benefits: variable compensation (continued)

Discontinued deferred compensation plans

The following plans have been discontinued.

Key Employee Stock Appreciation Rights Plan (KESAP) and Key Employee Stock Option Plan (KESOP)

Until 2009, certain key and high-potential employees were granted discretionary share-settled stock appreciation rights (SARs) or options on UBS shares with a strike price not less than the market value of a UBS share on the date of grant. SARs gave employees the right to receive a number of UBS shares equal to the increase in market price of the UBS share between the grant date and the exercise date. One option entitled the holder to acquire one registered UBS share at the option's strike price. SARs and options were settled by delivering UBS shares, except in jurisdictions where this was not permitted for legal reasons. All unexercised options and stock appreciation rights under these awards expired in 2019.

PartnerPlus

Through performance year 2016, financial advisor strategic objective awards were partly granted under the PartnerPlus deferred cash plan. In addition to such granted awards (UBS company contributions), participants were allowed to voluntarily contribute additional amounts otherwise payable as production payout up to a certain percentage, which vested upon contribution. Company contributions and voluntary contributions were credited with interest in accordance with the terms of the plan. Rather than being credited with interest, a participant could elect to have voluntary contributions, along with vested company contributions, credited with notional earnings based on the performance of various mutual funds. Company contributions and interest on both company and voluntary contributions ratably vest in 20% installments six to 10 years following grant date. Company contributions and interest on notional earnings on both company and voluntary contributions are forfeitable under certain circumstances.

GrowthPlus

GrowthPlus is a compensation plan for selected financial advisors whose revenue production and length of service exceeded defined thresholds from 2010 to 2017. Awards were granted in 2010, 2011, 2015 and 2018. The awards are cash-based and are distributed over seven years, with the exception of 2018 awards, which are distributed over five years.

b) Effect on the income statement

Effect on the income statement for the financial year and future periods

The table below provides information about compensation expenses related to total variable compensation, including financial advisor variable compensation, that were recognized in the financial year ended 31 December 2019, as well as expenses that were deferred and will be recognized in the income statement for 2020 and later.

The majority of expenses deferred to 2020 and later that are related to the performance year 2019 relates to awards granted in February 2020. The total unamortized compensation expense for unvested share-based awards granted up to 31 December 2019 will be recognized in future periods over a weighted average period of 2.4 years.

Variable compensation including financial advisor variable compensation

	Expenses recognized in 2019			Expenses deferred to 2020 and later[1]		
USD million	Related to the performance year 2019	Related to prior performance years	Total	Related to the performance year 2019	Related to prior performance years	Total
Non-deferred cash	1,706	(24)	1,682	0	0	0
Deferred compensation awards	287	576	863	413	592	1,005
of which: Equity Ownership Plan	*115*	*294*	*410*	*198*	*213*	*412*
of which: Deferred Contingent Capital Plan	*109*	*256*	*365*	*166*	*356*	*521*
of which: Long-Term Incentive Plan	*38*	*0*	*38*	*23*	*0*	*23*
of which: Asset Management EOP	*25*	*26*	*51*	*26*	*23*	*49*
Total variable compensation – performance awards	**1,993**	**553**	**2,545**	**413**	**592**	**1,005**
Replacement payments	5	49	55	43	30	73
Forfeiture credits	0	(84)	(84)	0	0	0
Severance payments	110	0	110	0	0	0
Retention plan and other payments	24	27	52	22	29	51
Deferred Contingent Capital Plan: interest expense	0	93	93	50	169	219
Total variable compensation – other	**140**	**85**	**225**	**115**	**228**	**343**
Financial advisor variable compensation	3,233	268	3,501	197	710	907
of which: non-deferred cash	*3,064*	*0*	*3,064*	*0*	*0*	*0*
of which: deferred share-based awards	*57*	*48*	*106*	*54*	*130*	*183*
of which: deferred cash-based awards	*112*	*219*	*331*	*144*	*580*	*724*
Compensation commitments with recruited financial advisors[2]	32	510	542	350	1,617	1,967
Total financial advisor variable compensation	**3,265**	**778**	**4,043**	**548**	**2,327**	**2,874**
Total variable compensation including FA variable compensation	**5,398**	**1,416**	**6,814[3]**	**1,076**	**3,146**	**4,222**

1 Estimate as of 31 December 2019. Actual amounts to be expensed in future periods may vary, e.g., due to forfeiture of awards. 2 Reflects expenses related to compensation commitments with financial advisors entered into at the time of recruitment that are subject to vesting requirements. Amounts reflected as deferred expenses represent the maximum deferred exposure as of the balance sheet date. 3 Includes USD 595 million in expenses related to share-based compensation (performance awards: USD 448 million; other variable compensation: USD 42 million; financial advisor compensation: USD 106 million). A further USD 54 million in expenses related to share-based compensation was recognized within other expense categories included in Note 6 (salaries: USD 10 million, related to role-based allowances; social security: USD 23 million; other personnel expenses: USD 22 million related to the Equity Plus Plan).

Financial statements

Note 30 Employee benefits: variable compensation (continued)

Variable compensation including financial advisor variable compensation (continued)

	Expenses recognized in 2018			Expenses deferred to 2019 and later[1]		
USD million	Related to the performance year 2018	Related to prior performance years	Total	Related to the performance year 2018	Related to prior performance years	Total
Non-deferred cash	1,896	(26)	1,870	0	0	0
Deferred compensation awards	360	564	924	570	638	1,208
of which: Equity Ownership Plan	*208*	*299*	*507*	*316*	*238*	*554*
of which: Deferred Contingent Capital Plan	*126*	*235*	*361*	*232*	*373*	*605*
of which: Asset Management EOP	*25*	*28*	*53*	*22*	*26*	*48*
of which: other performance awards	*0*	*2*	*2*	*0*	*1*	*1*
Total variable compensation – performance awards	**2,256**	**538**	**2,794**	**570**	**638**	**1,208**
Replacement payments	7	61	68	58	40	99
Forfeiture credits	0	(136)	(136)	0	0	0
Severance payments	106	0	106	0	0	0
Retention plan and other payments	31	33	64	23	33	56
Deferred Contingent Capital Plan: interest expense	0	116	116	96	191	288
Total variable compensation – other	**144**	**75**	**220**	**178**	**264**	**442**
Financial advisor variable compensation	3,233	237	3,470	128	639	767
of which: non-deferred cash	*3,089*	*0*	*3,089*	*0*	*0*	*0*
of which: deferred share-based awards	*51*	*44*	*95*	*52*	*131*	*183*
of which: deferred cash-based awards	*93*	*193*	*286*	*76*	*507*	*584*
Compensation commitments with recruited financial advisors[2]	33	551	584	357	1,883	2,240
Total financial advisor variable compensation	**3,266**	**789**	**4,054**	**484**	**2,522**	**3,006**
Total variable compensation including FA variable compensation	**5,666**	**1,402**	**7,068[3]**	**1,233**	**3,424**	**4,656**

1 Estimate as of 31 December 2018. Actual amounts expensed may vary, e.g., due to forfeiture of awards. 2 Reflects expenses related to compensation commitments with financial advisors entered into at the time of recruitment that are subject to vesting requirements. Amounts reflected as deferred expenses represent the maximum deferred exposure as of the balance sheet date. 3 Includes USD 612 million in expenses related to share-based compensation (performance awards: USD 507 million; other variable compensation: USD 10 million; financial advisor compensation: USD 95 million). A further USD 44 million in expenses related to share-based compensation was recognized within other expense categories included in Note 6 (salaries: USD 15 million, related to role-based allowances; social security: USD 7 million; other personnel expenses: USD 22 million, related to the Equity Plus Plan).

Note 30 Employee benefits: variable compensation (continued)

Variable compensation including financial advisor variable compensation (continued)

	Expenses recognized in 2017			Expenses deferred to 2018 and later[1]		
USD million	Related to the performance year 2017	Related to prior performance years	Total	Related to the performance year 2017	Related to prior performance years	Total
Non-deferred cash	1,982	(24)	1,958	0	0	0
Deferred compensation awards	392	704	1,096	589	685	1,274
of which: Equity Ownership Plan	*235*	*364*	*599*	*322*	*286*	*608*
of which: Deferred Contingent Capital Plan	*132*	*304*	*436*	*240*	*369*	*609*
of which: Asset Management EOP	*25*	*32*	*57*	*27*	*27*	*54*
of which: other performance awards	*0*	*4*	*4*	*0*	*3*	*3*
Total variable compensation – performance awards	**2,373**	**680**	**3,054**	**589**	**685**	**1,274**
Replacement payments	12	58	70	82	41	123
Forfeiture credits	0	(106)	(106)	0	0	0
Severance payments	95	0	95	0	0	0
Retention plan and other payments	24	38	62	30	32	62
Deferred Contingent Capital Plan: interest expense	0	110	110	80	218	297
Total variable compensation – other	**131**	**99**	**231**	**191**	**291**	**482**
Financial advisor variable compensation	3,050	260	3,310	156	795	951
of which: non-deferred cash	*2,891*	*0*	*2,891*	*0*	*0*	*0*
of which: deferred share-based awards	*54*	*48*	*102*	*70*	*121*	*191*
of which: deferred cash-based awards	*104*	*212*	*316*	*86*	*674*	*760*
Compensation commitments with recruited financial advisors[2]	31	723	754	369	2,058	2,429
Total financial advisor variable compensation	**3,080**	**984**	**4,064**	**526**	**2,853**	**3,379**
Total variable compensation including FA variable compensation	**5,585**	**1,764**	**7,349[3]**	**1,306**	**3,829**	**5,135**

1 Estimate as of 31 December 2017. Actual amounts expensed may vary, e.g., due to forfeiture of awards. 2 Reflects expenses related to compensation commitments with financial advisors entered into at the time of recruitment that are subject to vesting requirements. Amounts reflected as deferred expenses represent the maximum deferred exposure as of the balance sheet date. 3 Includes USD 726 million in expenses related to share-based compensation (performance awards: USD 599 million; other variable compensation: USD 25 million; financial advisor compensation: USD 102 million). A further USD 97 million in expenses related to share-based compensation was recognized within other expense categories included in Note 6 (salaries: USD 25 million, related to role-based allowances; social security: USD 49 million; other personnel expenses: USD 23 million, related to the Equity Plus Plan).

Note 30 Employee benefits: variable compensation (continued)

c) Outstanding share-based compensation awards

Share and performance share awards

Movements in outstanding share-based awards under the EOP during 2019 and 2018 are provided in the table below. The awards presented are granted by UBS AG, but are based on UBS Group AG shares.

Movements in outstanding share-based compensation awards

	Number of shares 2019	Weighted average grant date fair value (USD)	Number of shares 2018	Weighted average grant date fair value (USD)
Outstanding, at the beginning of the year	201,793	15	404,720	15
Awarded during the year	29,092	11	26,005	13
Distributed during the year	(140,441)	14	(228,932)	15
Forfeited during the year	0	0	0	0
Outstanding, at the end of the year	90,443	14	201,793	15
of which: shares vested for accounting purposes	*56,492*		*133,225*	

The total carrying amount of the liability related to cash-settled share-based awards as of 31 December 2019 and 31 December 2018 was USD 1 million and USD 2 million, respectively.

d) Valuation

UBS share awards

UBS measures compensation expense based on the average market price of the UBS share on the grant date as quoted on the SIX Swiss Exchange, taking into consideration post-vesting sale and hedge restrictions, non-vesting conditions and market conditions, where applicable. The fair value of the share awards subject to post-vesting sale and hedge restrictions is discounted on the basis of the duration of the post-vesting restriction and is referenced to the cost of purchasing an at-the-money European put option for the term of the transfer restriction. The weighted average discount for share and performance share awards granted during 2019 was approximately 22.6% (2018: 18.0%) of the market price of the UBS share. The grant date fair value of notional shares without dividend entitlements also includes a deduction for the present value of future expected dividends to be paid between the grant date and distribution.

Note 31 Interests in subsidiaries and other entities

a) Interests in subsidiaries

UBS AG defines its significant subsidiaries as those entities that, either individually or in aggregate, contribute significantly to UBS AG's financial position or results of operations, based on a number of criteria, including the subsidiaries' equity and their contribution to UBS AG's total assets and profit or loss before tax, in accordance with the requirements set by IFRS 12, Swiss regulations and the rules of the US Securities and Exchange Commission (SEC).

Individually significant subsidiaries

The table below list UBS AG's individually significant subsidiaries as of 31 December 2019. Unless otherwise stated, the subsidiaries listed below have share capital consisting solely of ordinary shares that are held entirely by UBS AG, and the proportion of ownership interest held is equal to the voting rights held by UBS AG.

The country where the respective registered office is located is also the principal place of business. UBS AG operates through a global network of branches and a significant proportion of its business activity is conducted outside Switzerland in the UK, the US, Singapore, Hong Kong and other countries. UBS Europe SE has branches and offices in a number of EU Member States, including Germany, Italy, Luxembourg, Spain and Austria. Share capital is provided in the currency of the legally registered office.

Individually significant subsidiaries of UBS AG as of 31 December 2019[1]

Company	Registered office	Primary business	Share capital in million		Equity interest accumulated in %
UBS Americas Holding LLC	Wilmington, Delaware, USA	Corporate Center	USD	3,150.0[2]	100.0
UBS Americas Inc.	Wilmington, Delaware, USA	Corporate Center	USD	0.0	100.0
UBS Asset Management AG	Zurich, Switzerland	Asset Management	CHF	43.2	100.0
UBS Bank USA	Salt Lake City, Utah, USA	Global Wealth Management	USD	0.0	100.0
UBS Europe SE	Frankfurt, Germany	Global Wealth Management	EUR	446.0	100.0
UBS Financial Services Inc.	Wilmington, Delaware, USA	Global Wealth Management	USD	0.0	100.0
UBS Securities LLC	Wilmington, Delaware, USA	Investment Bank	USD	1,283.1[3]	100.0
UBS Switzerland AG	Zurich, Switzerland	Personal & Corporate Banking	CHF	10.0	100.0

1 Includes direct and indirect subsidiaries of UBS AG. 2 Comprised of common share capital of USD 1,000 and non-voting preferred share capital of USD 3,150,000,000. 3 Comprised of common share capital of USD 100,000 and non-voting preferred share capital of USD 1,283,000,000.

Note 31 Interests in subsidiaries and other entities (continued)

Other subsidiaries

The table below lists other direct and indirect subsidiaries of UBS AG that are not individually significant but that contribute to UBS AG's total assets and aggregated profit before tax thresholds and are thereby disclosed in accordance with the requirements set by the SEC.

Other subsidiaries of UBS AG as of 31 December 2019

Company	Registered office	Primary business	Share capital in million		Equity interest accumulated in %
UBS Asset Management (Hong Kong) Limited	Hong Kong, Hong Kong	Asset Management	HKD	254.0	100.0
UBS Asset Management (Japan) Ltd	Tokyo, Japan	Asset Management	JPY	2,200.0	100.0
UBS Asset Management Life Ltd	London, United Kingdom	Asset Management	GBP	15.0	100.0
UBS Asset Management Switzerland AG	Zurich, Switzerland	Asset Management	CHF	0.5	100.0
UBS Business Solutions US LLC	Wilmington, Delaware, USA	Corporate Center	USD	0.0	100.0
UBS Credit Corp.	Wilmington, Delaware, USA	Global Wealth Management	USD	0.0	100.0
UBS (France) S.A.	Paris, France	Global Wealth Management	EUR	133.0	100.0
UBS Fund Advisor, L.L.C.	Wilmington, Delaware, USA	Global Wealth Management	USD	0.0	100.0
UBS Fund Management (Luxembourg) S.A.	Luxembourg, Luxembourg	Asset Management	EUR	13.0	100.0
UBS Fund Management (Switzerland) AG	Basel, Switzerland	Asset Management	CHF	1.0	100.0
UBS (Monaco) S.A.	Monte Carlo, Monaco	Global Wealth Management	EUR	49.2	100.0
UBS Realty Investors LLC	Boston, Massachusetts, USA	Asset Management	USD	9.0	100.0
UBS Securities (Thailand) Ltd	Bangkok, Thailand	Investment Bank	THB	500.0	100.0
UBS Securities Australia Ltd	Sydney, Australia	Investment Bank	AUD	0.3[1]	100.0
UBS Securities Japan Co., Ltd.	Tokyo, Japan	Investment Bank	JPY	32,100.0	100.0
UBS Securities Pte. Ltd.	Singapore, Singapore	Investment Bank	SGD	420.4	100.0

1 Includes a nominal amount relating to redeemable preference shares.

Consolidated structured entities

UBS AG consolidates a structured entity (SE) if it has power over the relevant activities of the entity, exposure to variable returns and the ability to use its power to affect its returns. Consolidated SEs include certain investment funds, securitization vehicles and client investment vehicles. UBS AG has no individually significant subsidiaries that are SEs.

Investment fund SEs are generally consolidated when UBS AG's aggregate exposure combined with its decision-making rights indicate the ability to use such power in a principal capacity. Typically, UBS AG will have decision-making rights as fund manager, earning a management fee, and will provide seed capital at the inception of the fund or hold a significant percentage of the fund units. Where other investors do not have the substantive ability to remove UBS as decision maker, UBS AG is deemed to have control and therefore consolidates the fund.

Securitization SEs are generally consolidated when UBS AG holds a significant percentage of the asset-backed securities issued by the SE and has the power to remove without cause the servicer of the asset portfolio.

Client investment SEs are generally consolidated when UBS AG has a substantive liquidation right over the SE or a decision right over the assets held by the SE and has exposure to variable returns through derivatives traded with the SE or holding notes issued by the SE.

In 2019 and 2018, UBS AG did not enter into any contractual obligation that could require UBS AG to provide financial support to consolidated SEs. In addition, UBS AG did not provide support, financial or otherwise, to a consolidated SE when UBS AG was not contractually obligated to do so, nor has UBS AG an intention to do so in the future. Further, UBS AG did not provide support, financial or otherwise, to a previously unconsolidated SE that resulted in UBS AG controlling the SE during the reporting period.

Note 31 Interests in subsidiaries and other entities (continued)

b) Interests in associates and joint ventures

As of 31 December 2019 and 2018, no associate or joint venture was individually material to UBS AG. In addition, there were no significant restrictions on the ability of associates or joint ventures to transfer funds to UBS AG or its subsidiaries in the form of cash dividends or to repay loans or advances made. There were no quoted market prices for any associates or joint ventures of UBS AG.

Investments in associates and joint ventures

USD million	2019	2018
Carrying amount at the beginning of the year	1,099	1,045
Additions	0	3
Disposals[1]	0	(431)
Reclassifications[2]		(21)
Share of comprehensive income	25	529
of which: share of net profit[3]	*46*	*529*
of which: share of other comprehensive income[4]	*(21)*	*1*
Dividends received	(83)	(42)
Impairment	(1)	
Foreign currency translation	11	16
Carrying amount at the end of the year	1,051	1,099
of which: associates	*1,010*	*1,066*
of which: SIX Group AG, Zurich[5]	*887*	*952*
of which: other associates	*123*	*114*
of which: joint ventures	*41*	*33*

1 In December 2018, UBS AG increased its shareholding in UBS Securities China from 24.99% to 51%, acquiring control of the entity in accordance with IFRS 10, Consolidated Financial Statements. Upon acquisition of control, UBS AG derecognized its former investment in associate. Refer to Note 32 for more information. 2 Reflects reclassifications to Properties and other non-current assets held for sale. 3 For 2019, consists of USD 28 million from associates and USD 18 million from joint ventures. For 2018, consists of USD 511 million from associates, of which USD 460 million reflected a valuation gain on the equity ownership in SIX related to the sale of SIX Payment Services to Worldline, and USD 18 million from joint ventures. 4 For 2019, consists of negative USD 22 million from associates and USD 1 million from joint ventures. For 2018, the total of USD 1 million is from associates. 5 In 2019, UBS AG's equity interest amounts to 17.31%. UBS AG is represented on the Board of Directors.

Note 31 Interests in subsidiaries and other entities (continued)

c) Interests in unconsolidated structured entities

During 2019, UBS AG sponsored the creation of various SEs and interacted with a number of non-sponsored SEs, including securitization vehicles, client vehicles as well as certain investment funds, that UBS did not consolidate as of 31 December 2019 because it did not control these entities.

The table below presents UBS AG's interests in and maximum exposure to loss from unconsolidated SEs as well as the total assets held by the SEs in which UBS had an interest as of year-end, except for investment funds sponsored by third parties, for which the carrying amount of UBS's interest as of year-end has been disclosed.

Interests in unconsolidated structured entities

	31.12.19				
USD million, except where indicated	Securitization vehicles	Client vehicles	Investment funds	Total	Maximum exposure to loss[1]
Financial assets at fair value held for trading	462	130	5,874	6,466	6,466
Derivative financial instruments	9	9	36	55	53
Loans and advances to customers			174	174	174
Financial assets at fair value not held for trading	81	8[2]	62	151	902
Financial assets measured at fair value through other comprehensive income		3,955		3,955	3,955
Other financial assets measured at amortized cost	335	16[2]		351	1,372
Total assets	888[3]	4,118	6,147	11,152	
Derivative financial instruments	2[4]	225	324	552	1
Total liabilities	2	225	324	552	
Assets held by the unconsolidated structured entities in which UBS had an interest (USD billion)	55[5]	73[6]	413[7]		

	31.12.18				
USD million, except where indicated	Securitization vehicles	Client vehicles	Investment funds	Total	Maximum exposure to loss[1]
Financial assets at fair value held for trading	420	174	7,297	7,890	7,890
Derivative financial instruments	8	35	1	44	44
Loans and advances to customers			179	179	179
Financial assets at fair value not held for trading	87	48[2]	85	220	1,796
Financial assets measured at fair value through other comprehensive income		3,931		3,931	3,931
Other financial assets measured at amortized cost	312	25[2]		337	1,423
Total assets	826[3]	4,212	7,562	12,600	
Derivative financial instruments	3[4]	123	32	158	3
Total liabilities	3	123	32	158	
Assets held by the unconsolidated structured entities in which UBS had an interest (USD billion)	63[5]	69[6]	385[7]		

1 For the purpose of this disclosure, maximum exposure to loss amounts do not consider the risk-reducing effects of collateral or other credit enhancements. 2 Represents the carrying amount of loan commitments. The maximum exposure to loss for these instruments is equal to the notional amount. 3 As of 31 December 2019, USD 0.6 billion of the USD 0.9 billion (31 December 2018: USD 0.6 billion of the USD 0.8 billion) was held in Corporate Center – Non-core and Legacy Portfolio. 4 Comprised of credit default swap liabilities and other swap liabilities. The maximum exposure to loss for credit default swap liabilities is equal to the sum of the negative carrying amount and the notional amount. For other swap liabilities, no maximum exposure to loss is reported. 5 Represents the principal amount outstanding. 6 Represents the market value of total assets. 7 Represents the net asset value of the investment funds sponsored by UBS and the carrying amount of UBS's interests in the investment funds not sponsored by UBS.

UBS AG retains or purchases interests in unconsolidated SEs in the form of direct investments, financing, guarantees, letters of credit, derivatives and through management contracts.

UBS AG's maximum exposure to loss is generally equal to the carrying amount of UBS AG's interest in the SE, with the exception of guarantees, letters of credit and credit derivatives, for which the contract's notional amount, adjusted for losses already incurred, represents the maximum loss that UBS AG is exposed to. In addition, the current fair value of derivative swap instruments with a positive replacement value only, such as total return swaps, is presented as the maximum exposure to loss. Risk exposure for these swap instruments could change over time with market movements.

The maximum exposure to loss disclosed in the table on the previous page does not reflect UBS AG's risk management activities, including effects from financial instruments that may be used to economically hedge the risks inherent in the unconsolidated SE or the risk-reducing effects of collateral or other credit enhancements.

In 2019 and 2018, UBS AG did not provide support, financial or otherwise, to an unconsolidated SE when not contractually obligated to do so, nor has UBS AG an intention to do so in the future.

In 2019 and 2018, income and expenses from interests in unconsolidated SEs primarily resulted from mark-to-market movements recognized in *Other net income from financial instruments measured at fair value through profit of loss*, which have generally been hedged with other financial instruments, as well as fee and commission income received from UBS-sponsored funds.

Interests in securitization vehicles

As of 31 December 2019 and 31 December 2018, UBS AG held interests, both retained and acquired, in various securitization vehicles, a majority of which are held within Corporate Center – Non-core and Legacy Portfolio. The Investment Bank also retained interests in securitization vehicles related to financing, underwriting, secondary market and derivative trading activities. In some cases UBS AG may be required to absorb losses from an unconsolidated SE before other parties because UBS AG's interest is subordinated to others in the ownership structure.

The numbers outlined in the table on the previous page may differ from the securitization positions presented in the 31 December 2019 Pillar 3 report under "Pillar 3 disclosures" at *www.ubs.com/investors,* for the following reasons: (i) exclusion of synthetic securitizations transacted with entities that are not SEs and transactions in which UBS AG did not have an interest because it did not absorb any risk; (ii) a different measurement basis in certain cases (e.g., IFRS carrying amount within the table above compared with net exposure amount at default for Pillar 3 disclosures); and (iii) different classification of vehicles viewed as sponsored by UBS AG versus sponsored by third parties.

→ **Refer to Note 1a item 1 for more information about UBS AG's accounting policies regarding consolidation and sponsorship of securitization vehicles and other structured entities**

→ **Refer to the 31 December 2019 Pillar 3 report under "Pillar 3 disclosures" at *www.ubs.com/investors* for more information**

Interests in client vehicles

As of 31 December 2019 and 31 December 2018, UBS AG retained interests in client vehicles sponsored by UBS AG and third parties that relate to financing and derivative activities, and to hedge structured product offerings. Included within these investments are securities guaranteed by US government agencies.

Interests in investment funds

UBS AG holds interests in a number of investment funds, primarily resulting from seed investments or in order to hedge structured product offerings. In addition to the interests disclosed in the table on the previous page, UBS AG manages the assets of various pooled investment funds and receives fees that are based, in whole or part, on the net asset value of the fund and/or the performance of the fund. The specific fee structure is determined on the basis of various market factors and considers the nature of the fund and the jurisdiction of incorporation, as well as fee schedules negotiated with clients. These fee contracts represent an interest in the fund as they align UBS AG's exposure with investors, providing a variable return that is based on the performance of the entity. Depending on the structure of the fund, these fees may be collected directly from the fund assets and/or from the investors. Any amounts due are collected on a regular basis and are generally backed by the assets of the fund. UBS AG did not have any material exposure to loss from these interests as of 31 December 2019 or as of 31 December 2018.

Note 31 Interests in subsidiaries and other entities (continued)

Sponsored unconsolidated structured entities in which UBS did not have an interest

For several sponsored SEs, no interest was held by UBS AG at year-end. However, during the respective reporting period UBS AG transferred assets, provided services and held instruments that did not qualify as an interest in these sponsored SEs, and accordingly earned income or incurred expenses from these entities. The table below presents the income earned and expenses incurred directly from these entities during the year as well as corresponding asset information. The table does not include income earned and expenses incurred from risk management activities, including income and expenses from financial instruments used to economically hedge instruments transacted with the unconsolidated SEs.

The majority of the fee income arose from investment funds that are sponsored and administrated by UBS AG, but managed by third parties. As UBS AG does not provide any active management services, UBS AG was not exposed to risk from the performance of these entities and was therefore deemed not to have an interest in them. In certain structures, the fees receivable may be collected directly from the investors and have therefore not been included in the table below.

UBS AG also recorded other net income from financial instruments measured at fair value through profit or loss from mark-to-market movements arising primarily from derivatives, such as interest rate and currency swaps as well as credit derivatives, through which UBS AG purchases protection, and financial liabilities designated at fair value, which do not qualify as interests because UBS AG does not absorb variability from the performance of the entity. Total income reported does not reflect economic hedges or other mitigating effects from UBS AG's risk management activities.

During 2019, UBS AG and third parties transferred assets of USD 1 billion and USD 1 billion, respectively, into sponsored securitization vehicles created in the year (2018: USD 1 billion and USD 1 billion, respectively). UBS AG and third parties also transferred assets of USD 0 billion and USD 1 billion, respectively, into sponsored client vehicles created in the year (2018: USD 2 billion and USD 0 billion, respectively). For sponsored investment funds, transfers arose during the period as investors invested and redeemed positions, thereby changing the overall size of the funds, which, when combined with market movements, resulted in a total closing net asset value of USD 42 billion (31 December 2018: USD 18 billion).

Sponsored unconsolidated structured entities in which UBS did not have an interest at year-end

	As of or for the year ended			
	31.12.19			
USD million, except where indicated	Securitization vehicles	Client vehicles	Investment funds	Total
Net interest income	(1)	0	(1)	(2)
Net fee and commission income		13	50	63
Other net income from financial instruments measured at fair value through profit or loss	19	(18)	9	11
Total income	19	(5)	58	72
Asset information (USD billion)	2[1]	1[2]	42[3]	

	As of or for the year ended			
	31.12.18			
USD million, except where indicated	Securitization vehicles	Client vehicles	Investment funds	Total
Net interest income	0	(6)	1	(5)
Net fee and commission income		16	39	54
Other net income from financial instruments measured at fair value through profit or loss	0	8	20	29
Total income	1	18	60	78
Asset information (USD billion)	2[1]	2[2]	18[3]	

1 Represents the amount of assets transferred to the respective securitization vehicles. 2 Represents the amount of assets transferred to the respective client vehicles. 3 Represents the total net asset value of the respective investment funds.

Note 32 Changes in organization and acquisitions and disposals of subsidiaries and businesses

Changes in Group structure and organization

UK business transfer and cross-border merger of UBS Limited into UBS Europe SE

In the fourth quarter of 2018, clients and other counterparties of UBS Limited who can be serviced by UBS AG, London Branch were generally migrated to UBS AG, London Branch. Transactions affecting the transferred businesses that occurred on or after the transfer date were recorded in UBS AG, London Branch.

On 1 March 2019, UBS AG completed its combined UK business transfer and cross-border merger of UBS Limited into UBS Europe SE, its Germany-headquartered European subsidiary.

UBS Asset Management AG

In 2016, UBS AG transferred the majority of the operating subsidiaries of Asset Management to UBS Asset Management AG. Effective 1 April 2019, as part of UBS's efforts to improve the resolvability of the Group, the portion of the Asset Management business in Switzerland conducted by UBS AG was transferred from UBS AG to its indirect subsidiary, UBS Asset Management Switzerland AG. With this transfer, UBS AG has completed the transfer of its Swiss Asset Management business and all Asset Management subsidiaries outside the US into a separate Asset Management sub-group structure.

UBS Group Funding (Switzerland) AG

UBS Group Funding (Switzerland) AG was established in 2016 as a wholly owned direct subsidiary of UBS Group AG, to issue loss-absorbing additional tier 1 (AT1) capital instruments and total loss-absorbing capacity (TLAC)-eligible senior unsecured debt, which were guaranteed by UBS Group AG. In line with regulatory requirements in Switzerland and following a change in Swiss tax law as of 1 January 2019 that applies to holding companies of systemically relevant banks issuing loss-absorbing AT1 or TLAC-eligible senior unsecured debt instruments, such existing instruments were migrated to UBS Group AG from UBS Group Funding (Switzerland) AG in October 2019.

UBS Business Solutions AG

In 2015, UBS Business Solutions AG was established as a direct subsidiary of UBS Group AG to act as the Group service company and UBS AG transferred the ownership of the majority of its existing service subsidiaries outside the US to UBS Business Solutions AG. In 2017, shared services functions in Switzerland and the UK were transferred from UBS AG to UBS Business Solutions AG and UBS AG also completed the transfer of the shared services employees in the US to its US service company, UBS Business Solutions US LLC, a wholly owned subsidiary of UBS Americas Holding LLC.

Acquisitions

Increase of stake in and consolidation of UBS Securities China

In December 2018, UBS AG increased its shareholding in UBS Securities China from 24.99% to 51%, acquiring control of the entity in accordance with IFRS 10, *Consolidated Financial Statements*. Upon acquisition of control, UBS AG remeasured its former 24.99% holding at fair value, resulting in a pre-tax loss of USD 270 million, recognized in *Other income*. In addition, a net foreign currency translation gain of USD 46 million was recognized upon derecognition of the former investment in associate, also in *Other income*.

The cost of acquisition of the additional 26.01% stake was USD 125 million. Upon consolidation, UBS AG recognized USD 102 million of goodwill and USD 278 million of other net assets. In addition, a non-controlling interest of USD 136 million has been recognized.

Sales and disposals of subsidiaries and businesses

In 2019, 2018 and 2017, no significant subsidiaries were removed from the scope of consolidation as a result of sales or disposals.

In the third quarter of 2018, UBS AG completed the sale of Widder Hotel, resulting in a pre-tax gain on sale of subsidiaries and businesses of USD 25 million and a pre-tax gain on sale of real estate of USD 31 million.

In 2017, UBS AG completed the sale of Asset Management's fund administration servicing units in Luxembourg and Switzerland to Northern Trust, resulting in a pre-tax gain on sale of USD 153 million.

Note 32 Changes in organization and acquisitions and disposals of subsidiaries and businesses (continued)

Strategic partnership with Sumitomo Mitsui Trust Holdings

In June 2019, UBS AG entered into a strategic wealth management partnership in Japan with Sumitomo Mitsui Trust Holdings, Inc. (SuMi Trust Holdings). In January 2020, the first phase was launched, with operations commencing in the newly established joint venture, UBS SuMi TRUST Wealth Advisory, which is owned equally by UBS Securities Japan and SuMi Trust Holdings and is accounted for as an investment in a joint venture by UBS AG. UBS AG and SuMi Trust Holdings have also started offering each other's products and services to their respective current clients.

The second phase of the partnership is expected to launch in 2021 with the establishment of a new entity which will be 51% owned and controlled by UBS AG, requiring UBS AG to consolidate this entity. UBS AG does not expect a material effect on shareholders' equity upon closing.

Strategic partnership with Banco do Brasil

In November 2019, UBS AG signed a binding agreement with Banco do Brasil to establish a strategic investment banking partnership that will provide investment banking services and institutional securities brokerage in Brazil and selected countries in South America. The partnership is expected to be established through a combination of assets from both stakeholders. UBS AG intends to contribute its operational investment banking platform in Brazil and Argentina, as well as its institutional brokerage business in Brazil. Banco do Brasil intends to contribute the exclusive access rights to its corporate clients. UBS AG will hold a controlling interest of 50.01% in the entity, requiring UBS AG to consolidate this entity. Closing of the transaction is subject to regulatory approvals and is currently expected in the first half of 2020. UBS AG does not expect a material effect on shareholders' equity upon closing.

Sale of majority stake in UBS Fondcenter

In January 2020, UBS AG has agreed to sell a majority stake in UBS Fondcenter to Clearstream, Deutsche Börse Group's post-trade services provider. UBS AG will retain a minority (48.8%) shareholding in the business and will enter into an agreement under which it may sell its remaining shareholding to Clearstream at a later date. As part of the transaction, UBS AG and Clearstream will enter into long-term commercial cooperation arrangements for the provision of services to Global Wealth Management, Asset Management and the Corporate & Institutional Clients unit of Personal & Corporate Banking. The transaction is subject to customary closing conditions and is expected to close in the second half of 2020. UBS AG expects to record a post-tax gain of around USD 600 million upon closing of the transaction. UBS AG will deconsolidate UBS Fondcenter and account for its minority interest as an investment in an associate.

Note 33 Finance lease receivables

UBS AG acts as a lessor and leases a variety of assets to third parties under finance leases, such as commercial vehicles, production lines, medical equipment, construction equipment and aircraft. At the end of the respective lease term, assets may be sold to third parties or further leased. Lessees may participate in any sales proceeds achieved. Lease payments cover the cost of the assets less their residual value as well as financing costs.

As of 31 December 2019, unguaranteed residual values of USD 246 million (31 December 2018: USD 156 million) had been accrued and the ECL stage 3 allowance for uncollectible minimum lease payments receivable was USD 6 million (31 December 2018: USD 7 million). No contingent rents were received in 2019. Amounts in the table below are disclosed on a gross basis. The finance lease receivables in Note 17a of USD 1,444 million are presented net of expected credit loss allowances.

Lease receivables

USD million	31.12.19		
	Total minimum lease payments	Unearned finance income	Present value
2020	448	31	417
2021–2024	874	52	822
Thereafter	221	6	215
Total	1,544	89	1,455

USD million	31.12.18		
	Total minimum lease payments	Unearned finance income	Present value
2019	359	22	337
2020–2023	703	35	669
Thereafter	103	2	102
Total	**1,166**	**58**	**1,107**

Note 34 Guarantees, commitments and forward starting transactions

The table below shows the maximum irrevocable amount of guarantees, commitments and forward starting transactions.

	Gross		Total gross	Sub-participations	Net
As of 31.12.19, USD million	Measured at fair value	Not measured at fair value			
Total guarantees	986	18,142	19,128	(2,646)	16,482
Loan commitments	6,308	27,547	33,856	(787)	33,069
Forward starting transactions[1]					
Reverse repurchase agreements	20,284	1,657	21,941		
Repurchase agreements	7,740	408	8,148		
As of 31.12.18, USD million					
Total guarantees	1,639	18,146	19,785	(2,803)	16,982
Loan commitments	3,535	31,212	34,747	(647)	34,099
Forward starting transactions[1]					
Reverse repurchase agreements	8,117	925	9,042		
Securities borrowing agreements		12	12		
Repurchase agreements	7,926	400	8,326		

1 Cash to be paid in the future by either UBS AG or the counterparty.

Financial statements

Note 35 Related parties

UBS AG defines related parties as associates (entities that are significantly influenced by UBS), joint ventures (entities in which UBS shares control with another party), post-employment benefit plans for UBS AG employees, key management personnel, close family members of key management personnel and entities that are, directly or indirectly, controlled or jointly controlled by key management personnel or their close family members. Key management personnel is defined as members of the Board of Directors (BoD) and Executive Board (EB).

a) Remuneration of key management personnel

The Chairman of the BoD has a specific management employment contract and receives pension benefits upon retirement. Total remuneration of the Chairman of the Board of Directors and all EB members is included in the table below.

Remuneration of key management personnel

USD million, except where indicated	31.12.19	31.12.18	31.12.17
Base salaries and other cash payments[1]	30	25	24
Incentive awards – cash[2]	13	14	13
Annual incentive award under DCCP	20	21	20
Employer's contributions to retirement benefit plans	2	3	3
Benefits in kind, fringe benefits (at market value)	1	2	2
Equity-based compensation[3]	34	38	36
Total	101	102	98
Total (CHF million)[4]	101	100	98

1 May include role-based allowances in line with market practice and regulatory requirements. 2 The cash portion may also include blocked shares in line with regulatory requirements. 3 Expenses for shares granted are calculated at grant date of the respective award and allocated over the vesting period of generally five years. Refer to Note 30 for more information. For EB members, equity-based compensation for 2019 was entirely comprised of LTIP awards and equity-based compensation for 2018 and 2017 was entirely comprised of EOP awards. For the Chairman of the BoD, the equity-based compensation for 2019, 2018 and 2017 was entirely comprised of UBS shares. 4 Swiss franc amounts disclosed represent the respective US dollar amounts translated at the applicable performance award currency exchange rates (2019: USD / CHF 0.99; 2018: USD / CHF 0.98; 2017: USD / CHF 1.00)

The independent members of the BoD do not have employment or service contracts with UBS AG, and thus are not entitled to benefits upon termination of their service on the BoD. Payments to these individuals for their services as external board members amounted to USD 7.3 million (CHF 7.3 million) in 2019, USD 7.6 million (CHF 7.4 million) in 2018 and USD 7.1 million (CHF 7.1 million) in 2017.

b) Equity holdings of key management personnel

Equity holdings of key management personnel

	31.12.19	31.12.18
Number of stock options from equity participation plans held by non-independent members of the BoD and the EB members[1]	0	0
Number of shares held by members of the BoD, EB and parties closely linked to them[2]	6,609,848	5,676,989

1 Refer to Note 30 for more information. 2 Excludes shares granted under variable compensation plans with forfeiture provisions.

Of the share totals above, no shares were held by close family members of key management personnel on 31 December 2019 and 95,597 shares were held by close family members of key management personnel on 31 December 2018. No shares were held by entities that are directly or indirectly controlled or jointly controlled by key management personnel or their close family members on 31 December 2019 and 31 December 2018. Refer to Note 30 for more information. As of 31 December 2019, no member of the BoD or EB was the beneficial owner of more than 1% of UBS Group AG's shares.

c) Loans, advances and mortgages to key management personnel

The non-independent members of the BoD and EB members are granted loans, fixed advances and mortgages in the ordinary course of business on substantially the same terms and conditions that are available to other employees, including interest rates and collateral, and neither involve more than the normal risk of collectibility nor contain any other unfavorable features for the firm. Independent BoD members are granted loans and mortgages in the ordinary course of business at general market conditions.

Movements in the loan, advances and mortgage balances are as follows.

Loans, advances and mortgages to key management personnel[1]

USD million, except where indicated	2019	2018
Balance at the beginning of the year	28	34
Additions	6	15
Reductions	(11)	(22)
Balance at the end of the year[2]	23	28
Balance at the end of the year (CHF million)[2, 3]	22	27

1 All loans are secured loans. 2 No unused uncommitted credit facilities as of 31 December 2019. Excludes unused uncommitted credit facilities for one EB member of USD 3,000,000 (CHF 2,949,690) as of 31 December 2018. 3 Swiss franc amounts disclosed represent the respective US dollar amounts translated at the relevant year-end closing exchange rate.

d) Other related-party transactions with entities controlled by key management personnel

In 2019 and 2018, UBS AG did not enter into transactions with entities that are directly or indirectly controlled or jointly controlled by UBS AG's key management personnel or their close family members and as of 31 December 2019, 31 December 2018 and 31 December 2017, there were no outstanding balances related to such transactions. Furthermore, in 2019 and 2018, entities controlled by key management personnel did not sell any goods or provide any services to UBS AG, and therefore did not receive any fees from UBS AG. UBS AG also did not provide services to such entities in 2019 and 2018, and therefore also received no fees.

Note 35 Related parties (continued)

e) Transactions with associates and joint ventures

Loans to and outstanding receivables from associates and joint ventures

USD million	2019	2018
Carrying amount at the beginning of the year	829	565
Additions	145	276
Reductions	(5)	(13)
Foreign currency translation	13	0
Carrying amount at the end of the year	982	829
of which: unsecured loans	*971*	*818*

Other transactions with associates and joint ventures

	As of or for the year ended	
USD million	31.12.19	31.12.18
Payments to associates and joint ventures for goods and services received	124	177
Fees received for services provided to associates and joint ventures	1	4
Liabilities to associates and joint ventures	101	
Commitments and contingent liabilities to associates and joint ventures	1,598	4

→ **Refer to Note 31 for an overview of investments in associates and joint ventures**

f) Receivables and payables from / to UBS Group AG and other subsidiaries of UBS Group AG

USD million	31.12.19	31.12.18
Receivables		
Loans and advances to customers	1,255	1,161
Financial assets at fair value held for trading	180	139
Other financial assets measured at amortized cost	60	105
Payables		
Customer deposits	2,314	2,152
Funding from UBS Group AG and its subsidiaries	47,866	41,202
Other financial liabilities measured at amortized cost	1,829	1,711
Other financial liabilities designated at fair value[1]	217	

1 Represents funding recognized from UBS Group AG and its subsidiaries that is designated at fair value. Refer to Note 22b for more information.

Note 36 Invested assets and net new money

Invested assets

Invested assets include all client assets managed by or deposited with UBS AG for investment purposes. Invested assets include managed fund assets, managed institutional assets, discretionary and advisory wealth management portfolios, fiduciary deposits, time deposits, savings accounts and wealth management securities or brokerage accounts. All assets held for purely transactional purposes and custody-only assets, including corporate client assets held for cash management and transactional purposes, are excluded from invested assets as UBS AG only administers the assets and does not offer advice on how the assets should be invested. Also excluded are non-bankable assets (e.g., art collections) and deposits from third-party banks for funding or trading purposes.

Discretionary assets are defined as client assets that UBS AG decides how to invest. Other invested assets are those where the client ultimately decides how the assets are invested. When a single product is created in one business division and sold in another, it is counted in both the business division that manages the investment and the one that distributes it. This results in double counting within UBS AG total invested assets, as both business divisions are independently providing a service to their respective clients, and both add value and generate revenue.

Net new money

Net new money in a reporting period is the amount of invested assets that are entrusted to UBS AG by new and existing clients, less those withdrawn by existing clients and clients who terminated their relationship with UBS AG.

Net new money is calculated using the direct method, under which inflows and outflows to / from invested assets are determined at the client level based on transactions. Interest and dividend income from invested assets are not counted as net new money inflows. Market and currency movements as well as fees, commissions and interest on loans charged are excluded from net new money, as are the effects resulting from any acquisition or divestment of a UBS AG subsidiary or business. Reclassifications between invested assets and custody-only assets as a result of a change in the service level delivered are generally treated as net new money flows. However, where the change in service level directly results from an externally imposed regulation or from a strategic decision by UBS AG to exit a market or specific service offering, the one-time net effect is reported as *Other effects*.

The Investment Bank does not track invested assets and net new money. However, when a client is transferred from the Investment Bank to another business division, this may produce net new money even though client assets were already with UBS AG. There were no such transfers between the Investment Bank and other business divisions in 2019 and 2018.

Invested assets and net new money

	As of or for the year ended	
USD billion	31.12.19	31.12.18
Fund assets managed by UBS	358	342
Discretionary assets	1,209	999
Other invested assets	2,040	1,760
Total invested assets[1]	3,607	3,101
of which: double counts	*248*	*213*
Net new money[1]	51	59

1 Includes double counts.

Development of invested assets

USD billion	2019	2018
Total invested assets at the beginning of the year[1]	3,101	3,262
Net new money	51	59
Market movements[2]	444	(180)
Foreign currency translation	6	(35)
Other effects	5	(5)
of which: acquisitions / (divestments)	*(1)*	*7*
Total invested assets at the end of the year[1]	3,607	3,101

1 Includes double counts. 2 Includes interest and dividend income.

Financial statements

Note 37 Currency translation rates

The following table shows the rates of the main currencies used to translate the financial information of UBS AG's operations with a functional currency other than the US dollar into US dollars.

	Closing exchange rate		Average rate[1]		
	As of		For the year ended		
	31.12.19	31.12.18	31.12.19	31.12.18	31.12.17
1 CHF	1.03	1.02	1.01	1.02	1.02
1 EUR	1.12	1.15	1.12	1.18	1.14
1 GBP	1.32	1.28	1.28	1.33	1.30
100 JPY	0.92	0.91	0.92	0.91	0.89

1 Monthly income statement items of operations with a functional currency other than the US dollar are translated with month-end rates into US dollars. Disclosed average rates for a year represent an average of 12 month-end rates, weighted according to the income and expense volumes of all operations of UBS AG with the same functional currency for each month. Weighted average rates for individual business divisions may deviate from the weighted average rates for UBS AG.

Note 38 Main differences between IFRS and Swiss GAAP

The consolidated financial statements of UBS AG are prepared in accordance with International Financial Reporting Standards (IFRS). The Swiss Financial Market Supervisory Authority (FINMA) requires financial groups that present their financial statements under IFRS to provide a narrative explanation of the main differences between IFRS and Swiss GAAP (FINMA Circular 2015 / 1 and the Banking Ordinance). Included in this Note are the significant differences in the recognition and measurement between IFRS and the provisions of the Banking Ordinance and the guidelines of FINMA governing true and fair view financial statement reporting pursuant to article 25 through article 42 of the Banking Ordinance.

1. Consolidation

Under IFRS, all entities that are controlled by the holding entity are consolidated.

Under Swiss GAAP, controlled entities that are deemed immaterial to UBS AG or that are held temporarily only are exempt from consolidation, but instead are recorded as participations accounted for under the equity method of accounting or as financial investments measured at the lower of cost or market value.

2. Classification and measurement of financial assets

Under IFRS, debt instruments are measured at amortized cost, fair value through other comprehensive income (FVOCI) or fair value through profit or loss (FVTPL) , depending on the nature of the business model within which the asset is held and the characteristics of the contractual cash flows of the asset. Equity instruments are accounted for at FVTPL by UBS AG.

Under Swiss GAAP, trading assets and derivatives are measured at FVTPL in line with IFRS. However, non-trading debt instruments are generally measured at amortized cost, even when the assets are managed on a fair value basis. In addition, the measurement of financial assets in the form of securities depends on the nature of the asset: debt instruments that are not held to maturity, i.e. instruments which are available for sale, as well as equity instruments with no permanent holding intent, are classified as *Financial investments* and measured at the lower of (amortized) cost or market value. Market value adjustments up to the original cost amount and realized gains or losses upon disposal of the investment are recorded in the income statement as *Other income from ordinary activities*. Equity instruments with a permanent holding intent are classified as participations in *Non-consolidated investments in subsidiaries and other participations* and are measured at cost less impairment.

Impairment losses are recorded in the income statement as *Impairment of investments in non-consolidated subsidiaries and other participations.* Reversals of impairments up to the original cost amount as well as realized gains or losses upon disposal of the investment are recorded as *Extraordinary income / Extraordinary expenses* in the income statement.

3. Fair value option applied to financial liabilities

Under IFRS, UBS AG applies the fair value option to certain financial liabilities not held for trading. Instruments for which the fair value option is applied are accounted for at FVTPL. The amount of change in the fair value that is attributable to changes in UBS AG's own credit is presented in *Other comprehensive income* directly within *Retained earnings*. The fair value option is applied primarily to issued structured debt instruments, certain non-structured debt instruments, certain payables under repurchase agreements and cash collateral on securities lending agreements, amounts due under unit-linked investment contracts, and brokerage payables.

Under Swiss GAAP, the fair value option can only be applied to structured debt instruments that consist of a debt host contract and one or more embedded derivatives that do not relate to own equity. Furthermore, unrealized changes in fair value attributable to changes in UBS AG's own credit are not recognized, whereas realized own credit is recognized in *Net trading income*.

4. Allowances and provisions for credit losses

Under IFRS, allowances and provisions for credit losses are estimated based on an expected credit loss model. Expected credit losses (ECL) are recognized for financial assets measured at amortized cost, financial assets measured at FVOCI, fee and lease receivables, financial guarantees, loan commitments and certain other credit facilities. Maximum 12-month ECL are recognized from initial recognition of instruments in stage 1. Lifetime ECL are recognized for instruments in stage 2 if a significant increase in credit risk is observed subsequent to the instrument's initial recognition. Lifetime ECL are also recognized for credit-impaired financial instruments, referred to as instruments in stage 3. Determination of whether an instrument is credit-impaired is based on the occurrence of one or more loss events.

Note 38 Main differences between IFRS and Swiss GAAP (continued)

Under Swiss GAAP, a claim is impaired and an allowance or provision for credit losses is recognized when objective evidence demonstrates that a loss event has occurred after the initial recognition and that the loss event has an effect on future cash flows that can be reliably estimated (incurred loss approach). UBS AG considers a claim to be impaired if it will be unable to collect all amounts due on it based on the original contractual terms as a result of credit deterioration of the issuer or counterparty. Impairment under the incurred loss approach is in line with ECL for credit-impaired claims in stage 3 under IFRS. A claim can be a loan or receivable or other debt instrument held to maturity measured at amortized cost, a debt instrument available for sale measured at the lower of amortized cost or market value, or a commitment, such as a letter of credit, a guarantee or a similar instrument.

An allowance for credit losses is reported as a decrease in the carrying amount of a financial asset. For an off-balance sheet item, such as a commitment, a provision for credit losses is reported in *Provisions*. Changes to allowances and provisions for credit losses are recognized in *Credit loss (expense) / recovery*.

5. Hedge accounting

Under IFRS, when cash flow hedge accounting is applied, the fair value gain or loss on the effective portion of the derivative designated as a cash flow hedge is recognized in equity. When fair value hedge accounting is applied, the fair value gains or losses of the derivative and the hedged item are recognized in the income statement.

Under Swiss GAAP, the effective portion of the fair value change of the derivative instrument designated as a cash flow or as a fair value hedge is deferred on the balance sheet as *Other assets* or *Other liabilities*. The carrying amount of the hedged item designated in fair value hedges is not adjusted for fair value changes attributable to the hedged risk.

6. Goodwill and intangible assets

Under IFRS, goodwill acquired in a business combination is not amortized but tested annually for impairment. Intangible assets with an indefinite useful life are also not amortized but tested annually for impairment.

Under Swiss GAAP, goodwill and intangible assets with indefinite useful lives are amortized over a period not exceeding five years, unless a longer useful life, which may not exceed 10 years, can be justified. In addition, these assets are tested annually for impairment.

7. Pension and other post-employment benefit plans

Swiss GAAP permits the use of IFRS or Swiss accounting standards for pension and other post-employment benefit plans, with the election made on a plan-by-plan basis.

UBS AG has elected to apply IFRS (IAS 19) for the non-Swiss defined benefit plans and Swiss GAAP (FER 16) for the Swiss pension plan in its standalone financial statements. The requirements of Swiss GAAP are better aligned with the specific nature of Swiss pension plans, which are hybrid in that they combine elements of defined contribution and defined benefit plans, but are treated as defined benefit plans under IFRS. Key differences between Swiss GAAP and IFRS include the treatment of dynamic elements, such as future salary increases and future interest credits on retirement savings, which are not considered under the static method used in accordance with Swiss GAAP. Also, the discount rate used to determine the defined benefit obligation in accordance with IFRS is based on the yield of high-quality corporate bonds of the market in the respective pension plan country. The discount rate used in accordance with Swiss GAAP (i.e., the technical interest rate) is determined by the Pension Foundation Board based on the expected returns of the Board's investment strategy.

For defined benefit plans, IFRS requires the full defined benefit obligation net of the plan assets to be recorded on the balance sheet, with changes resulting from remeasurements recognized directly in equity. However, for non-Swiss defined benefit plans for which IFRS accounting is elected, changes due to remeasurements are recognized in the income statement of UBS AG standalone under Swiss GAAP.

Swiss GAAP requires that employer contributions to the pension fund are recognized as personnel expenses in the income statement. Furthermore, Swiss GAAP requires an assessment as to whether, based on the financial statements of the pension fund prepared in accordance with Swiss accounting standards (FER 26), an economic benefit to, or obligation of, the employer arises from the pension fund which is recognized in the balance sheet when conditions are met. Conditions for recording a pension asset or liability would be met if, for example, an employer contribution reserve is available or the employer is required to contribute to the reduction of a pension deficit (on an FER 26 basis).

8. Leasing

Under IFRS, a single lease accounting model applies that requires UBS AG to record a right-of-use (RoU) asset and a corresponding lease liability on the balance sheet when UBS AG is a lessee in a lease arrangement. The RoU asset and the lease liability are recognized when UBS AG acquires control of the physical use of the asset. The lease liability is measured based on the present value of the lease payments over the lease term, discounted using UBS AG's unsecured borrowing rate. The RoU asset is recorded at an amount equal to the lease liability but is adjusted for rent prepayments, initial direct costs, any costs to refurbish the leased asset and/or lease incentives received. The RoU asset is depreciated over the shorter of the lease term or the useful life of the underlying asset.

Under Swiss GAAP, leases that transfer substantially all the risks and rewards, but not necessarily legal title in the underlying assets, are classified as finance leases. All other leases are classified as operating leases. Whereas finance leases are recognized on the balance sheet and measured in line with IFRS, operating lease payments are recognized as *General and administrative expenses* on a straight-line basis over the lease term, which commences with control of the physical use of the asset. Lease incentives are treated as a reduction of rental expense and are recognized on a consistent basis over the lease term.

9. Netting of replacement values

Under IFRS, replacement values and related cash collateral are reported on a gross basis unless the restrictive IFRS netting requirements are met: i) existence of master netting agreements and related collateral arrangements that are unconditional and legally enforceable, both in the normal course of business and in the event of default, bankruptcy or insolvency of UBS AG and its counterparties; and ii) UBS AG's intention to either settle on a net basis or to realize the asset and settle the liability simultaneously.

Under Swiss GAAP, replacement values and related cash collateral are generally reported on a net basis, provided the master netting and the related collateral agreements are legally enforceable in the event of default, bankruptcy or insolvency of UBS AG's counterparties.

10. Negative interest

Under IFRS, negative interest income arising on a financial asset does not meet the definition of interest income and, therefore, negative interest on financial assets and negative interest on financial liabilities are presented within interest expense and interest income, respectively.

Under Swiss GAAP, negative interest on financial assets is presented within interest income and negative interest on financial liabilities is presented within interest expense.

11. Extraordinary income and expense

Certain non-recurring and non-operating income and expense items, such as realized gains or losses from the disposal of participations, fixed and intangible assets, as well as reversals of impairments of participations and fixed assets, are classified as extraordinary items under Swiss GAAP. This distinction is not available under IFRS. ▲

Note 39 Supplemental guarantor information required under SEC regulations

Joint liability of UBS Switzerland AG

In 2015, the Personal & Corporate Banking and Wealth Management businesses booked in Switzerland were transferred from UBS AG to UBS Switzerland AG through an asset transfer in accordance with the Swiss Merger Act. Under the terms of the asset transfer agreement, UBS Switzerland AG assumed joint liability for contractual obligations of UBS AG existing on the asset transfer date, including the full and unconditional guarantee of certain registered debt securities issued by UBS AG. To reflect this joint liability, UBS Switzerland AG is presented in a separate column as a subsidiary co-guarantor.

The joint liability of UBS Switzerland AG for contractual obligations of UBS AG decreased in 2019 by USD 9 billion to USD 17 billion as of 31 December 2019, mainly driven by contractual maturities and, to a lesser extent, early extinguishments of UBS AG liabilities which existed at the date of the asset transfer in the second quarter of 2015.

Note 39 Supplemental guarantor information required under SEC regulations (continued)

Supplemental guarantor consolidated income statement

USD million For the year ended 31 December 2019	UBS AG (standalone)[1]	UBS Switzerland AG (standalone)[1]	Other subsidiaries[2]	Elimination entries	UBS AG (consolidated)
Operating income[3]					
Interest income	8,966	4,104	5,380	(3,028)	15,421
Interest expense	(9,472)	(1,021)	(3,583)	3,070	(11,006)
Net interest income	(506)	3,083	1,796	42	4,415
Other net income from financial instruments measured at fair value through profit or loss	5,116	924	1,114	(322)	6,833
Credit loss (expense) / recovery	(51)	7	(33)	0	(78)
Fee and commission income	3,285	4,342	12,527	(997)	19,156
Fee and commission expense	(674)	(819)	(1,188)	986	(1,696)
Net fee and commission income	2,610	3,523	11,338	(11)	17,460
Other income	4,962	259	1,960	(6,504)	677
Total operating income	12,131	7,796	16,176	(6,795)	29,307
Operating expenses					
Personnel expenses	3,251	1,936	8,614	0	13,801
General and administrative expenses	3,467	3,181	4,565	(2,627)	8,586
Depreciation and impairment of property, equipment and software	861	221	602	(108)	1,576
Amortization and impairment of goodwill and intangible assets	94	0	170	(88)	175
Total operating expenses	7,672	5,338	13,951	(2,823)	24,138
Operating profit / (loss) before tax	4,458	2,458	2,225	(3,972)	5,169
Tax expense / (benefit)	176	514	530	(21)	1,198
Net profit / (loss)	4,283	1,944	1,695	(3,951)	3,971
Net profit / (loss) attributable to non-controlling interests	0	0	6	0	6
Net profit / (loss) attributable to shareholders	4,283	1,944	1,689	(3,951)	3,965

1 Amounts presented for UBS AG standalone and UBS Switzerland AG standalone represent IFRS standalone information. Refer to the UBS AG standalone and UBS Switzerland AG standalone financial statements under "Complementary financial information" at www.ubs.com/investors for information prepared in accordance with Swiss GAAP. 2 The column "Other subsidiaries" includes consolidated information for the significant sub-groups UBS Americas Holding LLC, UBS Europe SE and UBS Asset Management AG, as well as standalone information for other subsidiaries. 3 Effective 1 January 2019, UBS AG, UBS Switzerland AG and certain other subsidiaries refined the presentation of dividend income and expense, reclassifying dividends from Interest income (expense) to Other net income from financial instruments measured at fair value through profit or loss. Prior-year comparative information was restated accordingly. Refer to Note 1b for more information.

Note 39 Supplemental guarantor information required under SEC regulations (continued)

Supplemental guarantor consolidated statement of comprehensive income

USD million For the year ended 31 December 2019	UBS AG (standalone)[1]	UBS Switzerland AG (standalone)[1]	Other subsidiaries[2]	Elimination entries	UBS AG (consolidated)
Comprehensive income attributable to shareholders					
Net profit / (loss)	4,283	1,944	1,689	(3,951)	3,965
Other comprehensive income					
Other comprehensive income that may be reclassified to the income statement					
Foreign currency translation, net of tax	(12)	150	39	(85)	92
Financial assets measured at fair value through other comprehensive income, net of tax	0	0	117	0	117
Cash flow hedges, net of tax	870	140	147	(15)	1,143
Total other comprehensive income that may be reclassified to the income statement, net of tax	859	290	303	(100)	1,351
Other comprehensive income that will not be reclassified to the income statement					
Defined benefit plans, net of tax	(78)	(6)	(75)	(11)	(170)
Own credit on financial liabilities designated at fair value, net of tax	(392)				(392)
Total other comprehensive income that will not be reclassified to the income statement, net of tax	(470)	(6)	(75)	(11)	(562)
Total other comprehensive income	388	284	228	(111)	789
Total comprehensive income attributable to shareholders	4,671	2,228	1,917	(4,062)	4,754
Total comprehensive income attributable to non-controlling interests			2		2
Total comprehensive income	4,671	2,228	1,919	(4,062)	4,756

1 Amounts presented for UBS AG standalone and UBS Switzerland AG standalone represent IFRS standalone information. Refer to the UBS AG standalone and UBS Switzerland AG standalone financial statements under "Complementary financial information" at www.ubs.com/investors for information prepared in accordance with Swiss GAAP. 2 The column "Other subsidiaries" includes consolidated information for the significant sub-groups UBS Americas Holding LLC, UBS Europe SE and UBS Asset Management AG, as well as standalone information for other subsidiaries.

Note 39 Supplemental guarantor information required under SEC regulations (continued)

Supplemental guarantor consolidated balance sheet

USD million As of 31 December 2019	UBS AG (standalone)[1]	UBS Switzerland AG (standalone)[1]	Other subsidiaries[2]	Elimination entries	UBS AG (consolidated)
Assets					
Cash and balances at central banks	36,386	60,926	9,756		107,068
Loans and advances to banks	32,888	7,992	17,430	(45,931)	12,379
Receivables from securities financing transactions	56,946	12,536	42,534	(27,771)	84,245
Cash collateral receivables on derivative instruments	22,830	990	8,508	(9,038)	23,289
Loans and advances to customers	88,386	193,543	63,676	(17,612)	327,992
Other financial assets measured at amortized cost	5,723	8,168	11,448	(2,327)	23,012
Total financial assets measured at amortized cost	243,159	284,154	153,351	(102,679)	577,985
Financial assets at fair value held for trading	113,802	53	15,320	(1,479)	127,695
of which: assets pledged as collateral that may be sold or repledged by counterparties	*58,599*	*0*	*5,386*	*(22,701)*	*41,285*
Derivative financial instruments	118,708	4,251	29,782	(30,899)	121,843
Brokerage receivables	11,453		6,556	(1)	18,007
Financial assets at fair value not held for trading	49,525	6,701	41,908	(14,498)	83,636
Total financial assets measured at fair value through profit or loss	293,488	11,004	93,565	(46,877)	351,181
Financial assets measured at fair value through other comprehensive income	176		6,169		6,345
Investments in subsidiaries and associates	51,212	28	39	(50,227)	1,051
Property, equipment and software[3]	7,318	1,144	3,749	(385)	11,826
Goodwill and intangible assets	222		6,212	35	6,469
Deferred tax assets	618	0	8,895		9,513
Other non-financial assets	5,060	1,770	857	(140)	7,547
Total assets	601,252	298,101	272,837	(200,273)	971,916
Liabilities					
Amounts due to banks	55,738	28,240	35,773	(113,181)	6,570
Payables from securities financing transactions	21,326	565	13,583	(27,696)	7,778
Cash collateral payables on derivative instruments	30,571	98	9,773	(9,027)	31,416
Customer deposits	85,954	239,226	86,550	38,861	450,591
Funding from UBS Group AG and its subsidiaries[4]	47,866				47,866
Debt issued measured at amortized cost	54,317	8,583	5	(70)	62,835
Other financial liabilities measured at amortized cost[3]	5,345	2,666	5,204	(2,842)	10,373
Total financial liabilities measured at amortized cost	301,117	279,379	150,888	(113,954)	617,429
Financial liabilities at fair value held for trading	25,292	383	6,233	(1,317)	30,591
Derivative financial instruments	117,597	4,046	30,089	(30,852)	120,880
Brokerage payables designated at fair value	25,358		11,877	(3)	37,233
Debt issued designated at fair value	65,677		952	(38)	66,592
Other financial liabilities designated at fair value	8,571		31,031	(3,445)	36,157
Total financial liabilities measured at fair value through profit or loss	242,495	4,429	80,184	(35,655)	291,452
Provisions	1,101	196	1,641		2,938
Other non-financial liabilities	1,644	931	3,559	34	6,168
Total liabilities	546,357	284,936	236,271	(149,576)	917,988
Equity attributable to shareholders	54,895	13,165	36,391	(50,697)	53,754
Equity attributable to non-controlling interests			174		174
Total equity	54,895	13,165	36,566	(50,697)	53,928
Total liabilities and equity	601,252	298,101	272,837	(200,273)	971,916

1 Amounts presented for UBS AG standalone and UBS Switzerland AG standalone represent IFRS standalone information. Refer to the UBS AG standalone and UBS Switzerland AG standalone financial statements under "Complementary financial information" at www.ubs.com/investors for information prepared in accordance with Swiss GAAP. 2 The column "Other subsidiaries" includes consolidated information for the significant sub-groups UBS Americas Holding LLC, UBS Europe SE and UBS Asset Management AG, as well as standalone information for other subsidiaries. 3 Includes the effects of the adoption of IFRS 16, Leases, as of 1 January 2019. Refer to Note 1 for more information. 4 Represents funding from UBS Group AG to UBS AG.

Note 39 Supplemental guarantor information required under SEC regulations (continued)

Supplemental guarantor consolidated statement of cash flows

USD million For the year ended 31 December 2019	UBS AG[1]	UBS Switzerland AG[1]	Other subsidiaries[1]	UBS AG (consolidated)
Net cash flow from / (used in) operating activities	17,531	8,882	(7,608)	18,805
Cash flow from / (used in) investing activities				
Purchase of subsidiaries, associates and intangible assets	(6)	0	(20)	(26)
Disposal of subsidiaries, associates and intangible assets[2]	100	0	14	114
Purchase of property, equipment and software	(628)	(173)	(600)	(1,401)
Disposal of property, equipment and software	10	0	1	11
Purchase of financial assets measured at fair value through other comprehensive income	(10)	0	(3,414)	(3,424)
Disposal and redemption of financial assets measured at fair value through other comprehensive income	10	0	3,904	3,913
Net (purchase) / redemption of debt securities measured at amortized cost	(1,045)	437	45	(562)
Net cash flow from / (used in) investing activities	(1,569)	264	(70)	(1,374)
Cash flow from / (used in) financing activities				
Net short-term debt issued / (repaid)	(17,150)	0	0	(17,149)
Distributions paid on UBS shares	(3,250)	0	0	(3,250)
Repayment of lease liabilities	(262)	0	(234)	(496)
Issuance of long-term debt, including debt issued designated at fair value	58,437	621	142	59,199
Repayment of long-term debt, including debt issued designated at fair value	(67,113)	(752)	(1,017)	(68,883)
Funding from UBS Group AG and its subsidiaries[3]	5,848	0	0	5,848
Net changes in non-controlling interests	0	0	(8)	(8)
Net activity related to group internal capital transactions and dividends	3,569	(2,055)	(1,514)	0
Net cash flow from / (used in) financing activities	(19,922)	(2,186)	(2,630)	(24,738)
Total cash flow				
Cash and cash equivalents at the beginning of the year	42,895	54,757	28,201	125,853
Net cash flow from / (used in) operating, investing and financing activities	(3,960)	6,961	(10,308)	(7,307)
Effects of exchange rate differences on cash and cash equivalents	664	833	(239)	1,258
Cash and cash equivalents at the end of the year[4]	39,598	62,551	17,655	119,804
of which: cash and balances at central banks	*36,275*	*60,926*	*9,756*	*106,957*
of which: loans and advances to banks	*2,697*	*1,127*	*7,493*	*11,317*
of which: money market paper[5]	*626*	*498*	*406*	*1,530*

1 Cash flows generally represent a third-party view from a UBS AG consolidated perspective, except for Net activity related to group internal capital transactions and dividends. 2 Includes dividends received from associates. 3 Represents funding from UBS Group AG to UBS AG. 4 Comprises balances with an original maturity of three months or less. USD 3,192 million of cash and cash equivalents were restricted. 5 Money market paper is included in the balance sheet under Financial assets at fair value held for trading, Financial assets measured at fair value through other comprehensive income, Financial assets at fair value not held for trading, and Other financial assets measured at amortized cost.

Note 39 Supplemental guarantor information required under SEC regulations (continued)

Supplemental guarantor consolidated income statement

USD million For the year ended 31 December 2018	UBS AG (standalone)[1]	UBS Switzerland AG (standalone)[1]	Other subsidiaries[2]	Elimination entries	UBS AG (consolidated)
Operating income[3]					
Interest income	8,176	4,263	5,308	(2,960)	14,787
Interest expense	(8,673)	(901)	(3,240)	2,998	(9,815)
Net interest income	(497)	3,363	2,068	38	4,971
Other net income from financial instruments measured at fair value through profit or loss	5,204	889	970	(110)	6,953
Credit loss (expense) / recovery	(37)	(52)	(9)	(19)	(117)
Fee and commission income	2,655	4,474	13,159	(656)	19,632
Fee and commission expense	(851)	(391)	(1,108)	648	(1,703)
Net fee and commission income	1,804	4,083	12,050	(8)	17,930
Other income	4,722	198	2,110	(6,125)	905
Total operating income	11,196	8,480	17,189	(6,223)	30,642
Operating expenses					
Personnel expenses	3,592	1,890	8,510	0	13,992
General and administrative expenses	4,691	3,471	5,403	(3,490)	10,075
Depreciation and impairment of property, equipment and software	715	21	316	0	1,052
Amortization and impairment of goodwill and intangible assets	3	0	62	0	65
Total operating expenses	9,001	5,382	14,291	(3,490)	25,184
Operating profit / (loss) before tax	2,195	3,098	2,898	(2,733)	5,458
Tax expense / (benefit)	25	670	577	73	1,345
Net profit / (loss)	2,170	2,428	2,321	(2,806)	4,113
Net profit / (loss) attributable to non-controlling interests	0	0	7	0	7
Net profit / (loss) attributable to shareholders	2,170	2,428	2,314	(2,806)	4,107

1 Amounts presented for UBS AG standalone and UBS Switzerland AG standalone represent IFRS standalone information. Refer to the UBS AG standalone and UBS Switzerland AG standalone financial statements under "Complementary financial information" at www.ubs.com/investors for information prepared in accordance with Swiss GAAP. 2 The column "Other subsidiaries" includes consolidated information for the significant sub-groups UBS Americas Holding LLC, UBS Europe SE, UBS Asset Management AG and UBS Limited, as well as standalone information for other subsidiaries. 3 Effective 1 January 2019, UBS AG, UBS Switzerland AG and certain other subsidiaries refined the presentation of dividend income and expense, reclassifying dividends from Interest income (expense) to Other net income from financial instruments measured at fair value through profit or loss. Prior-year comparative information was restated accordingly. Refer to Note 1b for more information.

Note 39 Supplemental guarantor information required under SEC regulations (continued)

Supplemental guarantor consolidated statement of comprehensive income

USD million For the year ended 31 December 2018	UBS AG (standalone)[1]	UBS Switzerland AG (standalone)[1]	Other subsidiaries[2]	Elimination entries	UBS AG (consolidated)
Comprehensive income attributable to shareholders					
Net profit / (loss)	2,170	2,428	2,314	(2,806)	4,107
Other comprehensive income					
Other comprehensive income that may be reclassified to the income statement					
Foreign currency translation, net of tax	(369)	(109)	215	(252)	(515)
Financial assets measured at fair value through other comprehensive income, net of tax	0	0	(45)	0	(45)
Cash flow hedges, net of tax	(277)	2	19	(13)	(269)
Total other comprehensive income that may be reclassified to the income statement, net of tax	(646)	(107)	189	(265)	(829)
Other comprehensive income that will not be reclassified to the income statement					
Defined benefit plans, net of tax	89	(126)	212	0	175
Own credit on financial liabilities designated at fair value, net of tax	509				509
Total other comprehensive income that will not be reclassified to the income statement, net of tax	598	(126)	212	0	684
Total other comprehensive income	(48)	(233)	401	(265)	(145)
Total comprehensive income attributable to shareholders	2,122	2,195	2,715	(3,071)	3,961
Total comprehensive income attributable to non-controlling interests			5		5
Total comprehensive income	2,122	2,195	2,721	(3,071)	3,967

1 Amounts presented for UBS AG standalone and UBS Switzerland AG standalone represent IFRS standalone information. Refer to the UBS AG standalone and UBS Switzerland AG standalone financial statements under "Complementary financial information" at www.ubs.com/investors for information prepared in accordance with Swiss GAAP. 2 The column "Other subsidiaries" includes consolidated information for the significant sub-groups UBS Americas Holding LLC, UBS Europe SE, UBS Asset Management AG and UBS Limited, as well as standalone information for other subsidiaries.

Note 39 Supplemental guarantor information required under SEC regulations (continued)

Supplemental guarantor consolidated balance sheet

USD million As of 31 December 2018	UBS AG (standalone)[1]	UBS Switzerland AG (standalone)[1]	Other subsidiaries[2]	Elimination entries	UBS AG (consolidated)
Assets					
Cash and balances at central banks	36,350	53,490	18,530		108,370
Loans and advances to banks	34,063	7,405	21,151	(45,978)	16,642
Receivables from securities financing transactions	70,028	28,637	51,617	(54,932)	95,349
Cash collateral receivables on derivative instruments	23,136	559	12,148	(12,240)	23,603
Loans and advances to customers	93,141	188,013	62,166	(21,838)	321,482
Other financial assets measured at amortized cost	4,696	8,564	11,247	(1,869)	22,637
Total financial assets measured at amortized cost	261,415	286,667	176,858	(136,857)	588,084
Financial assets at fair value held for trading	92,784	62	15,578	(3,911)	104,513
of which: assets pledged as collateral that may be sold or repledged by counterparties	*49,509*	*0*	*7,326*	*(24,714)*	*32,121*
Derivative financial instruments	119,590	3,834	38,760	(35,972)	126,212
Brokerage receivables	11,063		5,779	(2)	16,840
Financial assets at fair value not held for trading	50,592	7,177	41,184	(16,566)	82,387
Total financial assets measured at fair value through profit or loss	274,030	11,073	101,300	(56,451)	329,953
Financial assets measured at fair value through other comprehensive income	171		6,495		6,667
Investments in subsidiaries and associates	50,971	20	31	(49,922)	1,099
Property, equipment and software	6,546	242	1,714	(24)	8,479
Goodwill and intangible assets	308		6,395	(56)	6,647
Deferred tax assets	533	198	9,282	52	10,066
Other non-financial assets	4,623	1,659	766	14	7,062
Total assets	598,598	299,860	302,842	(243,244)	958,055
Liabilities					
Amounts due to banks	36,430	24,774	44,377	(94,618)	10,962
Payables from securities financing transactions	36,840	1,167	27,297	(55,008)	10,296
Cash collateral payables on derivative instruments	28,096	35	12,894	(12,118)	28,906
Customer deposits	77,180	245,452	82,360	16,994	421,986
Funding from UBS Group AG and its subsidiaries[3]	41,202				41,202
Debt issued measured at amortized cost	82,653	8,578	587	(573)	91,245
Other financial liabilities measured at amortized cost	4,170	1,454	3,790	(1,838)	7,576
Total financial liabilities measured at amortized cost	306,571	281,460	171,305	(147,161)	612,174
Financial liabilities at fair value held for trading	23,455	493	8,829	(3,828)	28,949
Derivative financial instruments	119,131	3,510	39,107	(36,025)	125,723
Brokerage payables designated at fair value	26,559		11,875	(14)	38,420
Debt issued designated at fair value	55,378		1,670	(17)	57,031
Other financial liabilities designated at fair value	10,936		28,618	(5,959)	33,594
Total financial liabilities measured at fair value through profit or loss	235,458	4,004	90,098	(45,843)	283,717
Provisions	1,361	163	1,850	83	3,457
Other non-financial liabilities	1,676	929	3,623	47	6,275
Total liabilities	545,067	286,556	266,876	(192,875)	905,624
Equity attributable to shareholders	53,531	13,304	35,790	(50,369)	52,256
Equity attributable to non-controlling interests			176		176
Total equity	53,531	13,304	35,966	(50,369)	52,432
Total liabilities and equity	598,598	299,860	302,842	(243,244)	958,055

1 Amounts presented for UBS AG standalone and UBS Switzerland AG standalone represent IFRS standalone information. Refer to the UBS AG standalone and UBS Switzerland AG standalone financial statements under "Complementary financial information" at www.ubs.com/investors for information prepared in accordance with Swiss GAAP. 2 The column "Other subsidiaries" includes consolidated information for the significant sub-groups UBS Americas Holding LLC, UBS Europe SE, UBS Asset Management AG and UBS Limited, as well as standalone information for other subsidiaries. 3 Represents funding from UBS Group Funding (Switzerland) AG to UBS AG.

Note 39 Supplemental guarantor information required under SEC regulations (continued)

Supplemental guarantor consolidated statement of cash flows

USD million For the year ended 31 December 2018[1]	UBS AG[2]	UBS Switzerland AG[2]	Other subsidiaries[2]	UBS AG (consolidated)
Net cash flow from / (used in) operating activities	(652)	14,887	13,509	27,744
Cash flow from / (used in) investing activities				
Purchase of subsidiaries, associates and intangible assets	(124)	(5)	(158)	(287)
Disposal of subsidiaries, associates and intangible assets[3]	97	0	40	137
Purchase of property, equipment and software	(822)	(170)	(481)	(1,473)
Disposal of property, equipment and software	111	0	3	114
Purchase of financial assets measured at fair value through other comprehensive income	(170)	0	(1,829)	(1,999)
Disposal and redemption of financial assets measured at fair value through other comprehensive income	20	15	1,325	1,361
Net (purchase) / redemption of debt securities measured at amortized cost	(1,000)	2,111	(4,881)	(3,770)
Net cash flow from / (used in) investing activities	(1,888)	1,951	(5,982)	(5,918)
Cash flow from / (used in) financing activities				
Net short-term debt issued / (repaid)	(12,295)	(3)	53	(12,245)
Distributions paid on UBS shares	(3,098)	0	0	(3,098)
Issuance of long-term debt, including debt issued designated at fair value	53,294	872	560	54,726
Repayment of long-term debt, including debt issued designated at fair value	(42,759)	(812)	(772)	(44,344)
Funding from UBS Group AG and its subsidiaries[4]	5,956	0	0	5,956
Net changes in non-controlling interests	0	0	(31)	(31)
Net activity related to group internal capital transactions and dividends	3,000	(2,372)	(628)	0
Net cash flow from / (used in) financing activities	4,098	(2,315)	(820)	963

Total cash flow

Cash and cash equivalents at the beginning of the year	41,570	40,961	22,256	104,787
Net cash flow from / (used in) operating, investing and financing activities	1,559	14,523	6,707	22,789
Effects of exchange rate differences on cash and cash equivalents	(234)	(726)	(762)	(1,722)
Cash and cash equivalents at the end of the year[5]	42,895	54,757	28,201	125,853
of which: cash and balances at central banks	*36,248*	*53,490*	*18,530*	*108,268*
of which: loans and advances to banks	*4,849*	*1,249*	*9,354*	*15,452*
of which: money market paper[6]	*1,798*	*18*	*318*	*2,133*

1 Upon adoption of IFRS 9 on 1 January 2018, cash flows from certain financial assets previously classified as available-for-sale assets have been reclassified from investing to operating activities as the assets are accounted for at fair value through profit or loss effective 1 January 2018. Refer to Note 1c of the Annual Report 2018 for more information. 2 Cash flows generally represent a third-party view from a UBS AG consolidated perspective, except for Net activity related to group internal capital transactions and dividends. 3 Includes dividends received from associates. 4 Represents funding from UBS Group Funding (Switzerland) AG to UBS AG. 5 Comprises balances with an original maturity of three months or less. USD 5,245 million of cash and cash equivalents were restricted. 6 Money market paper is included in the balance sheet under Financial assets at fair value held for trading, Financial assets measured at fair value through other comprehensive income, Financial assets at fair value not held for trading and Other financial assets measured at amortized cost.

Note 39 Supplemental guarantor information required under SEC regulations (continued)

Supplemental guarantor consolidated income statement

USD million For the year ended 31 December 2017	UBS AG (standalone)[1]	UBS Switzerland AG (standalone)[1]	Other subsidiaries[2]	Elimination entries	UBS AG (consolidated)
Operating income[3]					
Interest income	7,219	4,063	3,774	(2,338)	12,717
Interest expense	(6,101)	(680)	(2,161)	2,245	(6,696)
Net interest income	1,118	3,383	1,613	(93)	6,021
Other net income from financial instruments measured at fair value through profit or loss	3,821	918	836	64	5,640
Credit loss (expense) / recovery	(139)	(23)	(9)	40	(131)
Fee and commission income	2,561	4,424	13,315	(911)	19,390
Fee and commission expense	(968)	(380)	(1,357)	865	(1,840)
Net fee and commission income	1,594	4,045	11,958	(46)	17,550
Other income	4,387	172	3,022	(6,616)	965
Total operating income	10,780	8,495	17,420	(6,651)	30,044
Operating expenses					
Personnel expenses	4,488	2,060	8,403	0	14,952
General and administrative expenses	4,922	3,400	5,760	(5,081)	9,001
Depreciation and impairment of property, equipment and software	664	11	270	0	945
Amortization and impairment of goodwill and intangible assets	8	0	63	0	71
Total operating expenses	10,082	5,472	14,496	(5,081)	24,969
Operating profit / (loss) before tax	698	3,023	2,924	(1,570)	5,076
Tax expense / (benefit)	458	628	3,156	0	4,242
Net profit / (loss)	240	2,395	(232)	(1,570)	834
Net profit / (loss) attributable to preferred noteholders	73	0	0	0	73
Net profit / (loss) attributable to non-controlling interests	0	0	4	0	4
Net profit / (loss) attributable to shareholders	168	2,395	(236)	(1,569)	758

1 Amounts presented for UBS AG standalone and UBS Switzerland AG standalone represent IFRS standalone information. Refer to the UBS AG standalone and UBS Switzerland AG standalone financial statements under "Complementary financial information" at www.ubs.com/investors for information prepared in accordance with Swiss GAAP. 2 The column "Other subsidiaries" includes consolidated information for the significant sub-groups UBS Americas Holding LLC, UBS Europe SE, UBS Asset Management AG and UBS Limited, as well as standalone information for other subsidiaries. 3 Effective 1 January 2019, UBS AG, UBS Switzerland AG and certain other subsidiaries refined the presentation of dividend income and expense, reclassifying dividends from Interest income (expense) to Other net income from financial instruments measured at fair value through profit or loss. Prior-year comparative information was restated accordingly. Refer to Note 1b for more information.

Note 39 Supplemental guarantor information required under SEC regulations (continued)

Supplemental guarantor consolidated statement of comprehensive income

USD million For the year ended 31 December 2017	UBS AG (standalone)[1]	UBS Switzerland AG (standalone)[1]	Other subsidiaries[2]	Elimination entries	UBS AG (consolidated)
Comprehensive income attributable to shareholders					
Net profit / (loss)	168	2,395	(236)	(1,569)	758
Other comprehensive income					
Other comprehensive income that may be reclassified to the income statement					
Foreign currency translation, net of tax	2,177	500	(2,473)	1,318	1,522
Financial assets measured at fair value through other comprehensive income, net of tax	(10)	2	11	(93)	(91)
Cash flow hedges, net of tax	(474)	(162)	(1)	2	(635)
Total other comprehensive income that may be reclassified to the income statement, net of tax	1,693	340	(2,463)	1,226	797
Other comprehensive income that will not be reclassified to the income statement					
Defined benefit plans, net of tax	284	(22)	27	26	314
Own credit on financial liabilities designated at fair value, net of tax	(317)				(317)
Total other comprehensive income that will not be reclassified to the income statement, net of tax	(33)	(22)	27	26	(3)
Total other comprehensive income	1,660	318	(2,436)	1,252	794
Total comprehensive income attributable to shareholders	1,828	2,713	(2,672)	(317)	1,552
Total comprehensive income attributable to preferred noteholders	320				320
Total comprehensive income attributable to non-controlling interests			6		6
Total comprehensive income	2,148	2,713	(2,665)	(317)	1,878

1 Amounts presented for UBS AG standalone and UBS Switzerland AG standalone represent IFRS standalone information. Refer to the UBS AG standalone and UBS Switzerland AG standalone financial statements under "Complementary financial information" at www.ubs.com/investors for information prepared in accordance with Swiss GAAP. 2 The column "Other subsidiaries" includes consolidated information for the significant sub-groups UBS Americas Holding LLC, UBS Europe SE, UBS Asset Management AG and UBS Limited, as well as standalone information for other subsidiaries.

Note 39 Supplemental guarantor information required under SEC regulations (continued)

Supplemental guarantor consolidated statement of cash flows

USD million For the year ended 31 December 2017	UBS AG[1]	UBS Switzerland AG[1]	Other subsidiaries[1]	UBS AG (consolidated)
Net cash flow from / (used in) operating activities	(35,057)	(8,742)	(9,348)	(53,147)
Cash flow from / (used in) investing activities				
Purchase of subsidiaries, associates and intangible assets	0	(2)	(104)	(106)
Disposal of subsidiaries, associates and intangible assets[2]	291	0	48	339
Purchase of property, equipment and software	(1,054)	(86)	(393)	(1,532)
Disposal of property, equipment and software	1	0	209	210
Purchase of financial assets measured at fair value through other comprehensive income	(234)	0	(8,393)	(8,626)
Disposal and redemption of financial assets measured at fair value through other comprehensive income	3,489	1,580	10,181	15,250
Net (purchase) / redemption of financial assets held to maturity	(455)	364	0	(91)
Net cash flow from / (used in) investing activities	2,039	1,856	1,548	5,444
Cash flow from / (used in) financing activities				
Net short-term debt issued / (repaid)	24,556	(5)	(50)	24,500
Distributions paid on UBS shares	(2,219)	0	0	(2,219)
Issuance of long-term debt, including debt issued designated at fair value	39,232	631	409	40,270
Repayment of long-term debt, including debt issued designated at fair value	(43,605)	(589)	(993)	(45,187)
Funding from UBS Group AG and its subsidiaries[3]	11,180	0	0	11,180
Dividends paid and repayments of preferred notes	(782)	0	0	(782)
Net changes in non-controlling interests	0	0	(5)	(5)
Net activity related to group internal capital transactions and dividends	1,264	(194)	(1,071)	0
Net cash flow from / (used in) financing activities	29,625	(158)	(1,710)	27,758

Total cash flow

Cash and cash equivalents at the beginning of the year	43,495	45,815	29,674	118,984
Net cash flow from / (used in) operating, investing and financing activities	(3,393)	(7,043)	(9,510)	(19,944)
Effects of exchange rate differences on cash and cash equivalents	1,466	2,189	2,094	5,749
Cash and cash equivalents at the end of the year[4]	41,570	40,961	22,256	104,787
of which: cash and balances at central banks	*37,420*	*39,461*	*13,086*	*89,968*
of which: loans and advances to banks	*2,344*	*1,492*	*8,890*	*12,726*
of which: money market paper[5]	*1,806*	*7*	*280*	*2,093*

1 Cash flows generally represent a third-party view from a UBS AG consolidated perspective, except for Net activity related to group internal capital transactions and dividends. 2 Includes dividends received from associates. 3 Represents funding from UBS Group Funding (Switzerland) AG to UBS AG. 4 Comprises balances with an original maturity of three months or less. USD 2,497 of cash and cash equivalents were restricted. 5 Money market paper is included in the balance sheet under Financial assets at fair value held for trading, Financial assets measured at fair value through other comprehensive income, Financial assets at fair value not held for trading and Other financial assets measured at amortized cost.

The information in this Appendix 4 describes the risk management and control process of UBS AG and references herein to "**UBS**" or the "**Group**" are to UBS AG and its subsidiaries.

The information in this Appendix 4 has been extracted from the Annual Report 2019 as at and for the year ended 31 December 2019. References to page numbers in this Appendix 4 are to pages of such document. The page numbers of such document appear on the bottom left or right hand side of the pages in this Appendix 4.

Risk management and control

Overview of risks arising from our business activities

The scale of our business activities is dependent on the capital we have available to cover the risks in our businesses, the size of our on- and off-balance sheet assets through their contribution to our capital, leverage and liquidity ratios, and our risk appetite.

Our overall credit risk profile remained broadly unchanged in 2019 and we continued to manage market risks at generally low levels.

Operational resilience, conduct and prevention of financial crime remain key focus topics.

The "Risk measures and performance" table on the next page shows risk-weighted assets (RWA), the leverage ratio denominator (the LRD) and risk-based capital (RBC), as well as attributed tangible equity, total assets and operating profit before tax on both a reported and adjusted basis for our business divisions and Corporate Center. This illustrates how the activities in our business divisions and Corporate Center are captured in the risk measures mentioned above the table, and it illustrates their financial performance in the context of these measures.

→ **Refer to the "Capital management" section of this report for more information about RWA, LRD and our equity attribution framework**

→ **Refer to "Statistical measures" in this section for more information about RBC**

→ **Refer to the "Performance of our business divisions and Corporate Center – reported and adjusted" table in the "Group performance" section of this report for more information**

Key risks, risk measures and performance by business division and Corporate Center

Business divisions and Corporate Center	Global Wealth Management	Personal & Corporate Banking	Asset Management	Investment Bank	Corporate Center
Key risks arising from business activities	**Credit risk** from lending against securities collateral and mortgages, and a small amount of derivatives trading activity **Market risk** from municipal securities and taxable fixed-income securities	**Credit risk** from retail business, mortgages, secured and unsecured corporate lending, and a small amount of derivatives trading activity Minimal contribution to **market risk**	Small amounts of credit and market risk	**Credit risk** from lending (take and hold as well as temporary loan underwriting activities), derivatives trading and securities financing **Market risk** from primary underwriting activities and secondary trading	**Credit** and **market risk** arising from management of the Group's balance sheet, capital, profit or loss and liquidity portfolios
Operational risk, which includes compliance and conduct risks, is an inevitable consequence of being in business, as losses can result from inadequate or failed internal processes, people and systems, or from external events. It can arise as a result of our past and current business activities across all business divisions and Corporate Center.					

Risk measures and performance

	31.12.19					
USD billion, as of or for the year ended	Global Wealth Management	Personal & Corporate Banking	Asset Management	Investment Bank	Corporate Center	Group
Risk-weighted assets[1]	78.1	67.1	4.6	81.1	28.3	259.2
of which: credit and counterparty credit risk	*35.0*	*57.3*	*1.8*	*50.6*	*8.3*	*153.0*
of which: market risk	*0.8*	*0.0*	*0.0*	*4.6*	*1.1*	*6.6*
of which: operational risk	*35.9*	*7.7*	*2.0*	*22.5*	*9.4*	*77.5*
Leverage ratio denominator[1]	312.7	224.2	5.0	293.2	76.2	911.3
Risk-based capital[2]	6.6	4.9	0.4	7.0	16.1	35.0
Average attributed tangible equity[3]	11.5	8.4	0.4	12.2	15.1	47.6
Total assets	309.8	209.4	34.6	315.9	102.6	972.2
Operating profit / (loss) before tax (as reported)	3.4	1.4	0.5	0.8	(0.6)	5.6
Operating profit / (loss) before tax (adjusted)[4]	3.5	1.5	0.6	1.1	(0.5)	6.0

	31.12.18					
USD billion, as of or for the year ended	Global Wealth Management	Personal & Corporate Banking	Asset Management	Investment Bank	Corporate Center	Group
Risk-weighted assets[1]	74.3	63.9	4.3	93.2	28.1	263.7
of which: credit and counterparty credit risk	*32.5*	*54.7*	*1.8*	*51.3*	*7.7*	*147.9*
of which: market risk	*1.3*	*0.0*	*0.0*	*16.8*	*1.9*	*20.0*
of which: operational risk	*36.0*	*7.7*	*2.0*	*22.5*	*9.4*	*77.6*
Leverage ratio denominator[1]	315.8	213.7	5.0	283.4	86.5	904.6
Risk-based capital[2]	5.0	4.5	0.4	6.6	16.7	33.3
Average attributed tangible equity[3]	11.2	8.0	0.4	12.9	13.3	45.9
Total assets	313.7	200.7	28.1	302.1	113.7	958.4
Operating profit / (loss) before tax (as reported)	3.3	1.8	0.4	1.5	(1.0)	6.0
Operating profit / (loss) before tax (adjusted)[4]	3.3	1.4	0.5	1.7	(0.9)	6.1

1 Refer to the "Capital management" section of this report for more information. 2 Refer to "Statistical measures" in this section for more information on risk-based capital. 3 Average attributed tangible equity of the business divisions and Corporate Center as of 31 December 2018 has been restated for the changes in equity attribution in the first quarter of 2019. Refer to the "Significant accounting and financial reporting changes" section in this report for more information. 4 Refer to the "Performance of our business divisions and Corporate Center – reported and adjusted" table in the "Group performance" section of this report for more information.

Risk categories

We categorize the risk exposures of our business divisions and Corporate Center as outlined in the table below.

Risk definitions

	Risk managed by	Independent oversight by	Captured in our risk appetite framework
Primary risks: the risks that our businesses may take to generate a return			
Audited | **Credit risk:** the risk of loss resulting from the failure of a client or counterparty to meet its contractual obligations toward UBS. This includes settlement risk and loan underwriting risk. ***Settlement risk:*** the risk of loss resulting from transactions that involve exchange of value (e.g., security versus cash) where we must deliver without first being able to determine with certainty that we will receive the countervalue. ***Loan underwriting risk:*** the risk of loss arising during the holding period of financing transactions that are intended for further distribution. ▲	Business management	Risk Control	●
Audited | **Market risk (traded and non-traded):** the risk of loss resulting from adverse movements in market variables. Market variables include observable variables, such as interest rates, foreign exchange rates, equity prices, credit spreads and commodity (including precious metal) prices, and variables that may be unobservable or only indirectly observable, such as volatilities and correlations. Market risk includes issuer risk and investment risk. ***Issuer risk:*** the risk of loss from changes in fair value resulting from credit-related events affecting an issuer to which we are exposed through tradable securities or derivatives referencing the issuer. ***Investment risk:*** issuer risk associated with positions held as financial investments. ▲	Business management and Group Treasury	Risk Control	●
Country risk: the risk of losses resulting from country-specific events. It includes transfer risk, whereby a country's authorities prevent or restrict the payment of an obligation, as well as systemic risk events arising from country-specific political or macroeconomic developments.	Business management	Risk Control	●
Consequential risks: the risks to which our businesses are exposed as a consequence of being in business			
Audited | **Liquidity risk:** the risk that the bank will not be able to efficiently meet both expected and unexpected current and forecast cash flows and collateral needs without affecting either daily operations or the financial condition of the firm. ▲ Audited | **Funding risk:** the risk that the bank will be unable, on an ongoing basis, to borrow funds in the market on an unsecured (or even secured) basis at an acceptable price to fund actual or proposed commitments; i.e., the risk that UBS's funding capacity is not sufficient to support the firm's current business and desired strategy. ▲	Group Treasury	Risk Control	●
Structural foreign exchange risk: the risk of decreases in our capital due to changes in foreign exchange rates with an adverse translation effect on capital held in currencies other than the US dollar.	Group Treasury	Risk Control	●
Operational risk: the risk resulting from inadequate or failed internal processes, people and systems, or from external causes (deliberate, accidental or natural) that have an impact (either financial or non-financial) on UBS, its clients or the markets in which it operates. Events may be direct financial losses or indirect in the form of revenue forgone as a result of business suspension. They may also result in damage to our reputation and to our franchise that has longer-term financial consequences.	Business management	Group Compliance, Regulatory & Governance (GCRG)	●
Legal risk: the financial or reputational implications resulting from the risk of: (i) being held liable for a breach of applicable laws, rules or regulations; (ii) being held liable for a breach of contractual or other legal obligations; (iii) an inability or failure to enforce or protect contractual rights or non-contractual rights sufficiently to protect UBS's interests, including the risk of being party to a claim in respect of any of the above (and the risk of loss of attorney-client privilege in the context of any such claim); (iv) a failure to adequately develop, supervise and resource legal teams or adequately supervise external legal counsel advising on business legal risk and other matters; and (v) a failure to adequately manage any potential, threatened and commenced litigation and legal proceedings, including civil, criminal, arbitration and regulatory proceedings, and/or litigation risk or any dispute or investigation that may lead to litigation or threat of any litigation.		Legal	
Conduct risk: the risk that the conduct of the firm or its individuals unfairly impacts clients or counterparties, undermines the integrity of the financial system or impairs effective competition to the detriment of consumers.		GCRG	
Compliance risk: the risk incurred by the firm by not adhering to the applicable laws, rules and regulations, and our own internal standards.		GCRG	
Financial crime risk: the risk that UBS fails to detect criminal activities, including internal and external theft and fraud, money laundering, bribery and corruption, fails to comply with sanctions and embargoes, or fails to report or respond to requests from relevant authorities related to these matters.		GCRG	
Cybersecurity and information security risk: the risk of a material impact from an external or internal attack on our information systems with the purpose of data theft, fraud or denial of service. Cyberattacks are manifestations of a cyber threat into an act of aggression or criminal activity causing financial, regulatory or reputational harm or loss.	Business management and Group Technology	GCRG	
Pension risk: the risk of a negative impact on our capital as a result of deteriorating funded status from decreases in the fair value of assets held in the defined benefit pension funds and/or changes in the value of defined benefit pension obligations due to changes in actuarial assumptions (e.g., discount rate, life expectancy, rate of pension increase) and/or changes to plan designs.	Human Resources	Risk Control and Finance	●
Environmental and social risk: the risk that UBS supports clients, or sources from suppliers, who cause or contribute to severe environmental damage or human rights infringements. Environmental and social risks can also arise if UBS's operational activities and its employees (or contractors working on behalf of UBS) fail to operate within relevant environmental and human rights regulations. Environmental and social risks (including human rights and climate-related risks) may result in adverse financial and reputation impacts for UBS. → **Refer to the "Management of environmental and social risks" section of the Sustainability Report 2019**	Business management	Risk Control	●
Model risk: the risk of adverse consequences via financial loss or non-financial impact (e.g., poor business and/or strategic decision-making, or damage to the firm's reputation) resulting from decisions based on incorrect or misused model outputs and reports. Model risk may result from a number of sources: inputs, methodology, implementation or use.	Model owner	Risk Control	●
Business risks: the risks arising from the commercial, strategic and economic environment in which our businesses operate			
Business risk: the potential negative impact on earnings from lower-than-expected business volumes and/or margins, to the extent they are not offset by a decrease in expenses.	Business management	Finance	●
Reputational risks			
Reputational risk: the risk of damage to our reputation from the point of view of our stakeholders, such as clients, shareholders, staff and the general public.	All businesses and functions	All control functions	

Top and emerging risks

The top and emerging risks disclosed below reflect those that we currently think have the potential to materialize within one year and which could significantly affect the Group. Investors should also carefully consider all information set out in the "Risk factors" section of this report, where we discuss these and other material risks that we consider could have an effect on our ability to execute our strategy and may affect our business activities, financial condition, results of operations and business prospects.

- We are exposed to a number of macroeconomic issues as well as general market conditions. As noted in "Market and macroeconomic risks" in the "Risk factors" section of this report, these external pressures may have a significant adverse effect on our business activities and related financial results, primarily through reduced margins and revenues, asset impairments and other valuation adjustments. Accordingly, these macroeconomic factors are considered in the development of stress testing scenarios for our ongoing risk management activities.
- The outbreak of Covid-19 in China and its subsequent spread to other countries is likely to have at least a short-term adverse effect on economic activity in China and other affected countries, with a collateral impact on the global economy. A significant rise in the number of Covid-19 infections, infections in a wide range of countries and regions, or a prolongation of the outbreak, could increase the adverse economic effects. These adverse effects may materialize through adverse market performance, increased credit risk or negative effects on operational resilience.
- We are exposed to substantial changes in the regulation of our businesses that could have a material adverse effect on our business, as discussed in the "Regulatory and legal developments" section of this report and in "Regulatory and legal risks" in the "Risk factors" section of this report.
- As a global financial services firm we are subject to many different legal, tax and regulatory regimes and extensive regulatory oversight. We are exposed to significant liability risk and we are subject to various claims, disputes, legal proceedings and government investigations, as noted in "Regulatory and legal risks" in the "Risk factors" section of this report. Information about litigation, regulatory and similar matters we consider significant is disclosed in "Note 21 Provisions and contingent liabilities" in the "Consolidated financial statements" section of this report.
- One of the most critical risks facing the broader industry is the inability to keep pace with evolving cyber threats, such as data theft and data leakage, disruption of service and cyber fraud, all of which have the potential to significantly affect our business. Additionally, as a result of the operational complexity of all our businesses, we are continually exposed to operational resilience scenarios such as process error, failed execution, system failures and fraud.
- Conduct risks are inherent in our businesses. Achieving fair outcomes for our clients, upholding market integrity and cultivating the highest standards of employee conduct are of critical importance to the firm. Management of conduct risks is an integral part of our operational risk framework.
- Financial crime, including money laundering, terrorist financing, sanctions violation, fraud, bribery and corruption, presents significant risk. Heightened regulatory expectations and attention require investment in people and systems, while emerging technologies and changing geopolitical risks further increase the complexity of identifying and preventing financial crime. Refer to "Operational risk" in this section and "Strategy, management and operations risks" in the "Risk factors" section of this report for more information.

Risk governance

Our risk governance framework operates along three lines of defense.

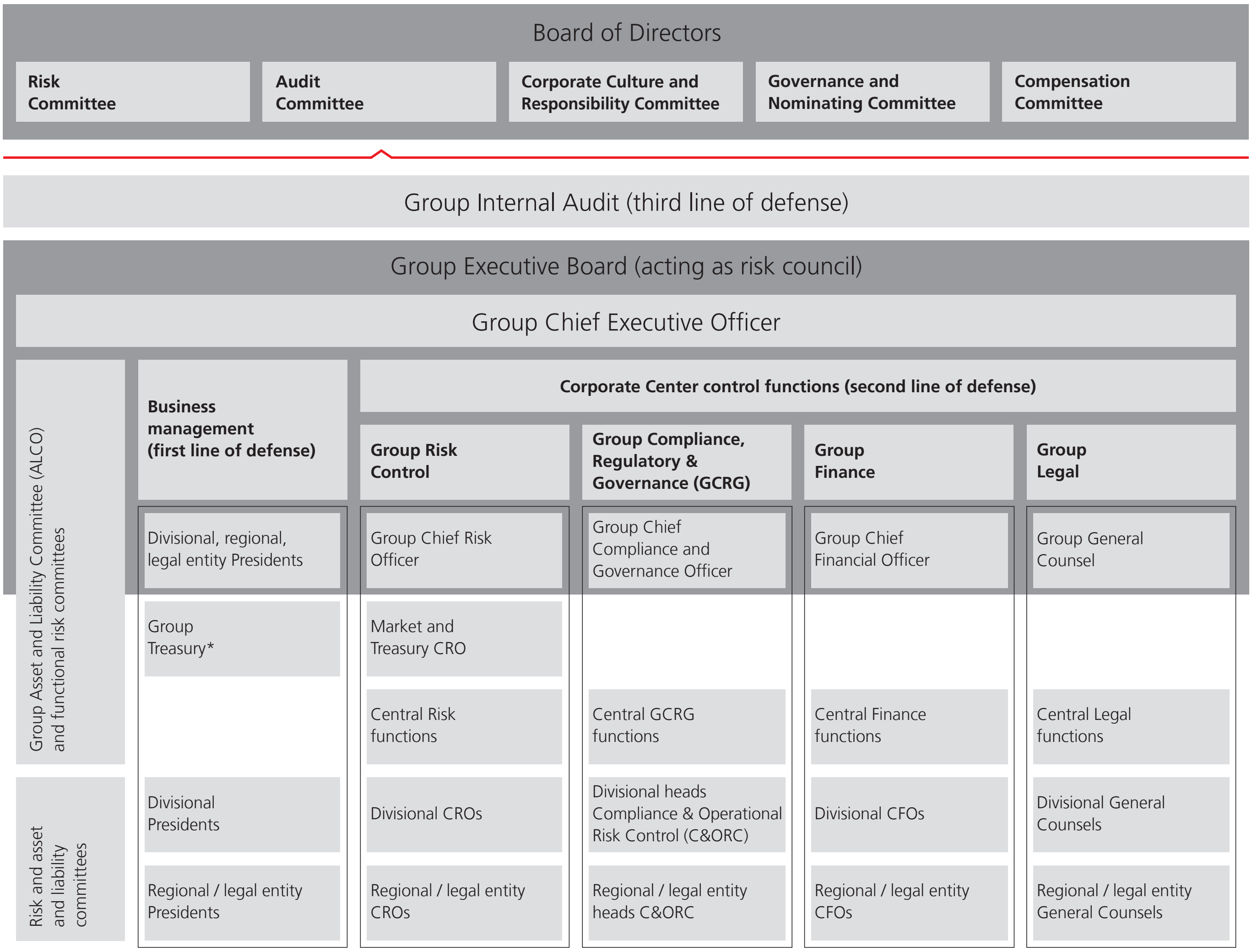
Our first line of defense, business management, owns its risk exposures and is required to maintain effective processes and systems to manage its risks, including robust and comprehensive internal controls and documented procedures. Business management has appropriate supervisory controls and review processes in place, which are designed to identify control weaknesses and inadequate processes.

Our second line of defense is formed by the control functions, which are separate from the business and report directly to the Group CEO. Control functions provide independent oversight of risks, including setting risk appetite and protecting against non-compliance with applicable laws and regulations.

Our third line of defense, Group Internal Audit, reports to the Audit Committee of the Board of Directors. This function evaluates the overall effectiveness of governance, risk management and the control environment, including the assessment of how the first and second lines of defense meet their objectives.

The key roles and responsibilities for risk management and control are illustrated in the following chart and described on the following pages.

Audited | **Risk governance**



* Part of Group Finance

Audited | The *Board of Directors* (the BoD) is responsible for approving the risk management and control framework of the Group, including the overall risk appetite of the Group and business divisions. The BoD is supported by the BoD Risk Committee, which monitors and oversees the Group's risk profile and the implementation of the risk framework as approved by the BoD, and approves the Group's risk appetite methodology. The Corporate Culture and Responsibility Committee supports the BoD in fulfilling its duty to safeguard and advance the Group's reputation for responsible and sustainable conduct. It reviews stakeholder concerns and expectations pertaining to UBS's societal contribution and corporate culture. The Audit Committee supports the BoD in fulfilling its oversight duty relating to financial reporting and internal controls over financial reporting, the effectiveness of the external and internal audit functions, and the effectiveness of whistleblowing procedures.

The *Group Executive Board* (the GEB) has overall responsibility for establishing and implementing risk management and control in the Group. It manages the risk profile of the Group as a whole.

The *Group Chief Executive Officer* (the Group CEO) has responsibility and accountability for the management and performance of the Group, has risk authority over transactions, positions and exposures, and allocates risk limits approved by the BoD within the business divisions and Corporate Center.

The *business division Presidents* are responsible for the success, risks, results and value of their business division. This includes controlling and administering the dedicated financial resources and risk appetite of the business division.

The *regional Presidents* facilitate the implementation of UBS's strategy in their region, and have the mandate to inform the GEB of any activities and issues that may give rise to actual or potentially material regulatory or reputational concerns.

The *Group Chief Risk Officer* (the Group CRO) is responsible for the development of the Group's risk management and control framework (including risk principles and risk appetite) for credit, market, country, liquidity, funding, model, and environmental and social risks. This includes risk measurement and aggregation, portfolio controls and risk reporting. The Group CRO is responsible for setting risk limits and approving credit and market risk transactions and exposures. Risk Control is also the central function for model risk management and control for all models used in the firm. The risk control process is supported by a framework of policies and authorities. The *business division CROs* are responsible for the implementation and enforcement of the risk management and control framework within their business division. The *regional Chief Risk Officers* provide independent oversight of risks within their region.

The *Group Chief Compliance and Governance Officer* is responsible for ensuring that all operational risks, including compliance and conduct risks, as well as cyber and information security risks, are identified, owned and managed according to the firm's risk appetite, supported by an effective control framework.

The *Group Chief Financial Officer* (the Group CFO) is responsible for transparency in and assessing the financial performance of the Group and the business divisions, and for managing the Group's financial accounting, controlling, forecasting, planning and reporting processes in line with regulatory and financial reporting requirements, corporate governance standards and global best practice to maintain high quality and timeliness. Additional responsibilities include managing UBS's tax affairs, as well as treasury and capital management, including funding and liquidity risk and UBS's regulatory capital ratios.

The *Group General Counsel* (the Group GC) is responsible for managing the Group's legal affairs and ensuring effective and timely assessment of legal matters impacting the Group or its businesses, and for the management and reporting of all litigation matters.

Group Internal Audit (GIA) independently assesses the effectiveness of processes to define strategy and risk appetite, as well as overall adherence to the approved strategy and the effectiveness of governance processes and of risk management at Group, business division and regional levels, including compliance with legal and regulatory requirements, as well as with internal policies, constitutional documents and contracts. The Head GIA reports to the Chairman of the BoD and, in addition, GIA has a functional reporting line to the BoD Audit Committee.

Some of the above roles and responsibilities are replicated for certain significant legal entities of the Group. The *legal entity risk officers* are responsible for independent oversight and control of primary and consequential risks for certain significant legal entities of the Group as part of the legal entity control framework, which complements the Group's risk management and control framework. ▲

Risk appetite framework

We have a defined Group level risk appetite, covering all financial and non-financial risk types, via a complementary set of qualitative and quantitative risk appetite statements. This is reviewed and recalibrated annually and presented to the BoD for approval.

Our risk appetite is defined at the aggregate Group level and reflects the types of risk that we are willing to accept or intend to avoid. It is established via a complementary set of qualitative and quantitative risk appetite statements defined at a firm-wide level and is embedded throughout our business divisions and legal entities by means of Group, business division and legal entity policies, limits and authorities. UBS is the largest truly global wealth manager and a leading personal and corporate bank in Switzerland, with focused investment bank and asset management divisions. We are subject to consolidated supervision by FINMA and related ordinances, which impose, among other requirements, minimum standards for capital, liquidity, risk concentration and internal organization. Our risk appetite is reviewed and recalibrated annually with an aim to ensure that risk-taking at every level of the organization is in line with our strategic priorities, our capital and liquidity plans, our pillars, principles and behaviors, as well as minimum regulatory requirements. The risk appetite statements are a critical foundation for maintaining a robust risk culture throughout our organization. The "Risk appetite framework" chart below shows the key elements of the framework. These elements are described in more detail in this section.

Qualitative statements aim to ensure that we maintain the desired risk culture. Quantitative risk appetite objectives are designed to enhance the Group's resilience against the effect of potential severe adverse economic or geopolitical events. These risk appetite objectives cover the Group's minimum capital and leverage ratios, its solvency, earnings, liquidity and funding, and are subject to periodic review, including as part of the annual business planning process.

These objectives are complemented by operational risk appetite objectives, which are established for each of our operational risk categories, such as market conduct, theft, fraud, data confidentiality and technology risks. A standardized financial firm-wide operational risk appetite has been established at the Group and business division level. Operational risk events that exceed predetermined risk tolerances, expressed as percentages of the Group's operating income, must be escalated as per the firm-wide escalation framework to the respective business division President or higher, as appropriate.

The quantitative risk appetite objectives are supported by a comprehensive suite of risk limits set at a portfolio level. These may apply across the Group, within a business division or business, at legal entity level, or to an asset class. These additional quantitative controls are typically bottom-up and are designed to monitor specific portfolios and to identify potential risk concentrations.

Risk appetite framework

Risk appetite framework

Risk appetite statements

Risk principles, governance, roles and responsibilities	Risk objectives, measures and controls
– Risk management and control principles – Code of Conduct and Ethics – Total Reward Principles – Organization regulations/policies – Roles and responsibilities	– Group-wide risk appetite objectives – Operational risk appetite objectives – Risk measurement frameworks – Authorities and limits

Risk reporting and disclosure, including internal, regulatory and external reporting

Risk reports containing aggregated measures of risk across products and businesses provide insight into the amounts, types, and sensitivities of the various risks in our portfolios and are intended to ensure compliance with defined limits. Risk officers, senior management and the BoD use this information to understand our risk profile and the performance of the portfolios.

The status of risk appetite objectives is evaluated each month and reported to the BoD and the GEB. Our risk appetite may change over time. Therefore, portfolio limits and associated approval authorities are subject to periodic reviews and changes, particularly in the context of our annual business planning process.

Our risk appetite framework is governed by a single overarching policy and conforms to the Financial Stability Board's Principles for an Effective Risk Appetite Framework published in 2013.

Risk principles and risk culture

We focus on maintaining a strong risk culture, which is a prerequisite for success in today's highly complex operating environment and a source of sustainable competitive advantage. By placing prudent and disciplined risk-taking at the center of every decision, we want to achieve our goals of delivering unrivaled client satisfaction, creating long-term value for stakeholders, and making UBS one of the most attractive companies to work for in the world.

Our risk appetite framework combines all the important elements of our risk culture, expressed in our *Pillars, Principles and Behaviors*, our risk management and control principles, our Code of Conduct and Ethics, and our Total Reward Principles. Together, these aim to align the decisions we make with the Group's strategy, principles and risk appetite. They help provide a solid foundation for promoting risk awareness, leading to appropriate risk-taking and the establishment of robust risk management and control processes. These principles are supported by a range of initiatives covering employees at all levels. This includes the *UBS House View on Leadership*, which is a set of explicit expectations for leaders that establishes consistent leadership standards across UBS. These initiatives also include our principles of good supervision, which establish clear expectations of managers and employees with respect to supervisory responsibilities, specifically: to take responsibility; to know and organize their business; to know their employees and what they do; to create a good risk culture; and to respond to and resolve issues.

→ **Refer to the foldout pages of this report for more information about our Pillars, Principles and Behaviors**

→ **Refer to the Code of Conduct and Ethics of UBS at *www.ubs.com/code* for more information**

Risk management and control principles

Protection of financial strength	Protection of reputation	Business management accountability	Independent controls	Risk disclosure
Protecting UBS's financial strength by controlling our risk exposure and avoiding potential risk concentrations at individual exposure levels, at specific portfolio levels and at an aggregate firm-wide level across all risk types	Protecting our reputation through a sound risk culture characterized by a holistic and integrated view of risk, performance and reward, and through full compliance with our standards and principles, particularly our Code of Conduct and Ethics	Maintaining management accountability, whereby business management, as opposed to Risk Control, owns all risks assumed throughout the Group and is responsible for the continuous and active management of all risk exposures to provide for balanced risk and return	Independent control functions that monitor the effectiveness of the businesses' risk management and oversee risk-taking activities	Disclosure of risks to senior management, the BoD, investors, regulators, credit rating agencies and other stakeholders with an appropriate level of comprehensiveness and transparency

To support an environment where our employees are comfortable in raising concerns, we have whistleblowing policies and procedures in place. These offer multiple channels through which individuals may, either openly or anonymously, escalate suspected breaches of laws, regulations, rules and other legal requirements, our Code of Conduct and Ethics, policies, or relevant professional standards. Our program is designed to ensure that whistleblowing concerns are investigated and that appropriate and consistent action is taken. We are committed to ensuring that appropriate training for and communication to staff and legal entity representatives are made available on an ongoing basis, including with regard to new regulatory requirements.

We also have mandatory training programs covering a range of compliance and risk-related topics, including anti-money laundering and operational risk. In addition, specialized training is provided for employees depending on their specific roles and responsibilities, such as credit risk and market risk training for those working in trading areas. Failure to satisfactorily complete mandatory training sessions within the given deadline has consequences, including disciplinary action. Our operational risk framework, incorporating the conduct risk framework, aims to identify and manage financial, regulatory, and reputational risks, together with risks to clients and to markets.

Additionally, we want to be the financial provider of choice for clients wishing to direct capital toward investments that support the Sustainable Development Goals and the transition to a low-carbon economy. Our comprehensive environmental and social risk framework governs client and supplier relationships, applies firm-wide to all activities, meets the highest industry standards and is integrated in management practices and control principles. We also seek to protect our assets from climate change risks by limiting our risk appetite for carbon-related assets.

Quantitative risk appetite objectives

Through a set of quantitative risk appetite objectives, we aim to ensure that our aggregate risk exposure remains within our desired risk capacity, based on our capital and business plans. The specific definition of risk capacity for each objective seeks to ensure that we have sufficient capital, earnings, funding and liquidity to protect our business franchises and exceed minimum regulatory requirements under a severe stress event. The risk appetite objectives are evaluated as part of the annual business planning process, and are approved by the BoD. The comparison of risk exposure with risk capacity is a key consideration in management decisions on potential adjustments to the business strategy and the risk profile of the Group.

Through the annual business planning process, we review the business strategy of the firm, assess the risk profile as a result of our operations and activities, and stress-test our risk profile. We make use of both scenario-based stress tests and statistical risk measurement techniques to assess the effect of a severe stress event at a firm-wide level. These complementary frameworks capture exposures to all material primary and consequential risks, as well as business risks across our business divisions and Corporate Center.

→ **Refer to "Risk measurement" in this section for more information about our stress testing and statistical frameworks**

2019 quantitative risk appetite objectives

Group-wide quantitative risk appetite objectives

Minimum capital objectives
Capital is sufficient to maintain a post-stress fully applied CET1 capital ratio of at least 10%.

Minimum leverage ratio objectives
Capital is sufficient to maintain a leverage ratio of at least 2.5% based on CET1 capital, even if a severe stress event were to occur.

Solvency objectives
CET1 capital plus contingent capital is sufficient to ensure that the probability of loss for the firm's debt holders is consistent with the firm's target credit rating.

Earnings objectives
Negative earnings under stress over a one-year horizon do not exceed (in absolute value) average reported earnings during the past three years. In addition, the loss should not be above 50% of three-year average earnings in year two and earnings should be positive in year three.

Liquidity objectives
Ensure that the firm has sufficient funding sources to survive a severe three-month idiosyncratic and market-wide liquidity stress event; allowing for discrete management actions under Treasury control without significantly impacting our business franchises and without any government support.

Funding objectives
Ensure that the firm has sufficient long-term funding to maintain franchise assets at a constant level under stressed market conditions for up to one year.

Risk capacity

Projected earnings
adjusted to reflect business risk

Capital
adjusted to reflect stress impact on capital-relevant elements

Risk exposure

Statistical measures
earnings-at-risk, capital-at-risk, risk-based capital

Stress measures
combined stress test

Credit risk
(including settlement risk and loan underwriting risk)

Market risk
(including issuer risk and investment risk)

Country risk

Primary risks

Operational risk

Structural FX risk

Liquidity and funding risk

Pension risk

Consequential risks

Granular limit framework

The Group-wide stress and statistical metrics are complemented with a granular framework that establishes limits and thresholds at a portfolio and position level.

Our risk capacity is underpinned by our performance targets and capital guidance as per our latest three-year strategic plan. When determining our risk capacity in case of a severe stress event, we adjust projected earnings from the strategic plan for business risk to reflect lower expected earnings and lower expenses, such as the reversal of variable compensation accruals. We also adjust our capital to take into account the effect of stress on deferred tax assets, pension plan assets and liabilities, and accruals for capital returns to shareholders.

The chart on the previous page provides an overview of our quantitative risk appetite objectives during 2019. For 2020, we have adjusted the one-year firm-wide minimum post-stress CET1 capital and leverage ratio objectives from 10% and 2.5% to 9% and 2.7%, respectively. The new objectives account for the various ongoing enhancements to stress measures, many of which lead to higher results for the same amount of underlying risk. We have also introduced three-year minimum post-stress capital and leverage ratio objectives of 7.5% and 2.2%, respectively, to better align with regulatory scenarios.

Risk appetite objectives define the aggregate risk exposure acceptable at the firm-wide level, given our risk capacity. The maximum acceptable risk exposure is supported by a comprehensive suite of risk limits, triggers and targets, which are cascaded to businesses and portfolios. These limits, triggers and targets are intended to ensure that our risks in aggregate remain under the maximum acceptable level of risk exposure.

Risk appetite statements at the business division level are derived from the firm-wide risk appetite. They may also comprise objectives specific to the division, related to the specific activities and risks in that division. Risk appetite statements are also set for certain legal entities. These must be consistent with the firm-wide risk appetite framework and approved in accordance with the legal entity's and the Group's regulations. Differences may exist that reflect the specific nature, size, complexity and regulations applicable to the relevant legal entity.

Risk appetite following adoption of IFRS 9

The introduction of the expected credit loss (ECL) framework under IFRS 9 in 2018 fundamentally changed how credit risk arising from loans, loan commitments, guarantees and certain revocable facilities is accounted for. The ECL framework may result in greater volatility in credit loss expense as ECL changes in response to developments in the credit cycle and composition of our loan portfolio. The effect may be more pronounced in a deteriorating economic environment.

The effect that the requirement for accelerated recognition of credit losses has on our risk exposure in stressed conditions has been accounted for in our estimations. We expect to gain more insights into the behavior of ECLs once IFRS 9 has been in place for a longer period and under changing economic conditions, and may adjust our risk exposure further in the future.

Based on the current information and the effect that the IFRS 9 ECL framework has on our solvency objectives, we have not changed either our risk appetite and management practices or our strategy toward pricing and structuring of transactions following the adoption of IFRS 9.

→ **Refer to "Note 1 Summary of significant accounting policies" in the "Consolidated financial statements" section of this report for more information about our accounting policy for allowances and provisions for ECL**

→ **Refer to "Note 23 Expected credit loss measurement" in the "Consolidated financial statements" section of this report for more information about ECL measurement**

→ **Refer to "Credit risk" in this section for more information about the ECL methodology under IFRS 9**

Internal risk reporting

Comprehensive and transparent reporting of risks is central to the control and oversight responsibilities set out in our risk governance framework and is a requirement of our risk management and control principles. Accordingly, risks are reported at a frequency and to a level of detail commensurate with the extent and variability of the risk and the needs of the various governance bodies, regulators and risk authority holders.

On a monthly basis, the Group Risk Report provides a detailed qualitative and quantitative overview of developments in primary and consequential risks for the business divisions and Corporate Center, along with aggregate views of risks at the firm-wide level, including the status of our risk appetite objectives and results of firm-wide stress testing. The Group Risk Report is distributed internally to the BoD Risk Committee and the GEB, and to senior members of Risk Control, Group Internal Audit, Finance, and Legal. Additionally, an extract of the Group Risk Report is provided to the BoD. Risk reports are also produced for our significant Group entities (entities that are subject to enhanced standards of corporate governance).

Granular divisional risk reports are provided to the respective business division Chief Risk Officers and the business division Presidents. This monthly reporting is supplemented with a suite of daily or weekly reports at various levels of granularity, covering market and credit risks for the business divisions and Corporate Center to enable risk officers and senior management to monitor and control the Group's risk profile.

Our internal risk reporting, which covers primary and consequential risks, is supported by risk data and measurement systems that are also used for external disclosure and regulatory reporting. Dedicated units within Risk Control assume responsibility for measurement, analysis and reporting of risk and for overseeing the quality and integrity of risk-related data. Our risk data and measurement systems are subject to periodic review by Group Internal Audit following a risk-based audit approach.

Risk measurement

Audited | We apply a variety of methodologies and measurements to quantify the risks of our portfolios and potential risk concentrations. Risks that are not fully reflected within standard measures are subject to additional controls, which may include preapproval of specific transactions and the application of specific restrictions. Models to quantify risk are generally developed by dedicated units within control functions and are subject to independent validation. ▲

Models must be approved and are regularly reviewed in accordance with regulatory requirements as well as internal policies to test whether they perform as expected, produce results comparable with actual events and values, and reflect best-in-practice approaches and recent academic developments. Our reviews assess whether models are performing satisfactorily, whether additional analysis is required and whether models need to be recalibrated or redeveloped. Results and conclusions are presented to the relevant governance body and, as required, to regulators.

The ongoing process of assessing model quality and performance in the production environment comprises two components: model validation, in which Model Risk Management & Control (MRMC) independently assesses a model's fitness for purpose; and model confirmation, the regular process of confirming the accuracy and appropriateness of the model output and its application, carried out by the model developers and reviewed by MRMC.

→ **Refer to "Credit risk," "Market risk" and "Operational risk" in this section for more information about model confirmation procedures**

Stress testing

We perform stress testing to estimate the loss that could result from extreme, yet plausible macroeconomic and geopolitical stress events. This enables us to identify, better understand and manage our potential vulnerabilities and risk concentrations. Stress testing plays a key role in our limits framework at the firm-wide, business division, legal entity and portfolio levels. Stress test results are regularly reported to the BoD, the BoD Risk Committee and the GEB. As described in "Risk appetite framework" above, stress testing, along with statistical loss measures, plays a central role in our risk appetite and business planning processes.

Our stress testing framework incorporates three pillars: (i) combined stress tests; (ii) a comprehensive range of portfolio- and risk type-specific stress tests; and (iii) reverse stress testing.

Our *combined stress test* (CST) framework is scenario-based and aims to quantify overall firm-wide losses that could result from a number of potential global systemic events. The framework captures all material primary and consequential risks, as well as business risks, as indicated in "Risk categories" above. Scenarios are forward-looking and encompass macroeconomic and geopolitical stress events calibrated to different levels of severity. We implement each scenario through the expected evolution of market indicators and economic variables under that scenario. We then assess the resulting effect on our primary, consequential and business risks to estimate the overall loss and capital implications were the scenario to occur. At least once a year, the BoD Risk Committee approves the most relevant scenario, known as the binding scenario, to be used as the main scenario for regular CST reporting and for monitoring risk exposure against our minimum capital, earnings and leverage ratio objectives in our risk appetite framework. Results are reported to the BoD Risk Committee, the BoD, the GEB and FINMA on a monthly basis.

We provide detailed stress loss analyses to FINMA and the regulators of our legal entities in accordance with their requirements. For example, in addition to CST, we perform Loss Potential Analysis (LPA) as prescribed by FINMA, Comprehensive Capital Analysis and Review (CCAR) for Americas Holding LLC as prescribed by the US Federal Reserve Board, and Comprehensive Assessment Stress Test for UBS Europe SE as prescribed by the European Central Bank.

The Enterprise-wide Stress Committee (the ESC) is responsible for ensuring the consistency and adequacy of the assumptions and scenarios used for our firm-wide stress measures. As part of these responsibilities, the ESC seeks to ensure that the suite of stress scenarios adequately reflects current and potential developments in the macroeconomic and geopolitical environment, our current and planned business activities, and actual or potential risk concentrations and vulnerabilities in our portfolios. The ESC meets at least quarterly and is comprised of Group, business division and legal entity representatives of Risk Control. In executing its responsibilities, the ESC considers input from the Think Tank, which is a panel of senior representatives from the business divisions, Risk Control and economic research, and which meets quarterly to review the current and possible future market environment in order to identify potential stress scenarios that could materially affect the Group's profitability. This results in a range of internal stress scenarios that are developed and evolve over time, separate from the scenarios mandated by FINMA.

Each scenario captures a wide range of macroeconomic variables. These include gross domestic product (GDP), equity prices, interest rates, foreign exchange rates, commodity prices, property prices and unemployment. We use assumed changes in these macroeconomic and market variables in each scenario to stress the key risk drivers of our portfolios. For example, lower GDP growth and rising interest rates may reduce the income of clients to whom we have lent money, which leads to changes in the credit risk parameters for probability of default, loss given default and exposure at default, and results in higher predicted credit losses within the stress scenario. We also capture the business risk resulting from lower fee, interest and trading income net of lower expenses. These effects are measured across all material risk types and all businesses to calculate the aggregate estimated effect of the scenario on profit or loss, other comprehensive income, RWA, LRD and, ultimately, our capital and leverage ratios. The assumed changes in macroeconomic variables are updated periodically to account for changes in the current and possible future market environment.

Through 2019, the binding scenario for CST was the internal *Severe Eurozone Crisis scenario*. This scenario is characterized by a crisis in the eurozone; a lack of confidence in the trajectory of several peripheral European economies leading to a sudden spike in their bond yields, eventually resulting in their loss of market access. As Greece leaves the eurozone, emergency measures, including capital controls, bailouts and debt restructurings, are required. In the ensuing global slowdown and market turbulence, China suffers a hard landing, which further weighs on global growth. Central banks in major developed economies with policy room cut rates back to zero in an attempt to stimulate growth and restore market confidence; however, this fails to avert a severe global recession.

The CST risk exposure was broadly stable over the year with most of the month-on-month variability arising primarily from changes in volumes of temporary loan underwriting exposure in the Investment Bank.

As part of the CST framework, we routinely monitored four additional stress scenarios throughout 2019.

– The *Failure of a Major Financial Institution scenario* represents renewed financial market turmoil reflecting the failure of a major global financial institution, leading to prolonged financial deleveraging and dramatically plunging activity around the globe.
– The *US Monetary Crisis scenario* represents a loss of confidence in the US, which leads to international portfolio repositioning out of US dollar-denominated assets, sparking an abrupt and substantial US dollar sell-off. The US is pushed back into recession, other industrialized countries replicate this pattern and inflationary concerns lead to an overall higher interest rate level.
– The *Global Depression scenario* represents a severe and prolonged eurozone crisis in which several peripheral countries default and exit the eurozone, and advanced economies are pulled into a prolonged period of economic stagnation.
– The *Global Interest Rate Steepening scenario* represents a sudden shift in market sentiment, causing a disorderly sell-off in long-dated bonds and a rapid steepening of the yield curve, exacerbated by a lack of liquidity in financial markets. This in turn triggers a sovereign crisis in Japan and a global recession.

We have updated the binding stress scenario in our CST framework for 2020 and renamed it *Global Crisis scenario*. The scenario maintains a eurozone crisis at its core, but has greater focus on risks threatening the global economy, such as protectionism. In addition, central banks in the eurozone, Switzerland and Japan are assumed to push policy rates further into negative territory to provide more monetary stimulus. A China hard landing remains a feature of the scenario.

Portfolio-specific stress tests are measures that are tailored to the risks of specific portfolios. Our portfolio stress loss measures are derived from data on past events, but also include forward-looking elements. For example, we derive the expected market movements within our liquidity-adjusted stress metric using a combination of historical market behavior, based on an analysis of historical events, and forward-looking analysis, including consideration of defined scenarios that are not modeled on any historical events. Results of portfolio-specific stress tests may be subject to limits to explicitly control risk-taking, or may be monitored without limits to identify vulnerabilities.

Reverse stress testing starts from a defined stress outcome (e.g., a specified loss amount, reputational damage, a liquidity shortfall or a breach of regulatory capital ratios) and works backward to identify the economic or financial scenarios that could result in such an outcome. As such, reverse stress testing is intended to complement scenario-based stress tests by assuming "what if" outcomes that could extend beyond the range normally considered, and thereby potentially challenge assumptions regarding severity and plausibility.

Additionally, we routinely analyze the effect of increases or decreases in interest rates and changes in the structure of yield curves.

Moreover, Group Treasury performs stress testing to determine the optimum asset and liability structure that allows us to maintain an appropriately balanced liquidity and funding position under various scenarios. These scenarios differ from those outlined above, because they are focused on specific situations that could generate liquidity and funding stress, as opposed to the scenarios used in the CST framework, which focus on the effect on profit or loss and capital.

→ **Refer to "Credit risk" and "Market risk" in this section for more information about stress loss measures**

→ **Refer to the "Treasury management" section of this report for more information about stress testing**

→ **Refer to "Our stated capital returns objective is based, in part, on capital ratios that are subject to regulatory change and may fluctuate significantly" in the "Risk factors" section of this report for more information**

Statistical measures

In addition to our scenario-based CST measures, we employ a statistical stress framework that allows us to calculate and aggregate risks using statistical techniques to derive stress events at chosen confidence levels.

We use this framework to derive a distribution of potential earnings based on historically observed market changes in combination with the firm's actual risk exposures, considering effects on both income and expenses. From this, we determine earnings-at-risk (EaR), which measures the potential shortfall in earnings (i.e., the deviation from forecast earnings) at a 95% confidence level and is evaluated over a one-year horizon. EaR is used for the assessment of the earnings objectives in our risk appetite framework.

We extend the EaR measure by incorporating the effects of gains and losses recognized through other comprehensive income, to derive a distribution of potential effects of stress events on CET1 capital. From this distribution, we derive our capital-at-risk (CaR) buffer measure at a 95% confidence level for the assessment of our capital and leverage ratio risk appetite objectives, and we derive our CaR solvency measure at a 99.9% confidence level for the assessment of our solvency risk appetite objective.

We also use the CaR solvency measure as the basis for deriving the contributions of business divisions and Corporate Center to risk-based capital (RBC), which is a component of our equity attribution framework. RBC measures the potential capital impairment from an extreme stress event at a 99.9% confidence level to estimate the capital required to absorb unexpected loss while remaining able to fully repay creditors.

→ **Refer to the "Capital management" section of this report for more information about the equity attribution framework**

Portfolio and position limits

The firm-wide stress and statistical metrics are complemented by more granular portfolio and position limits, triggers and targets. The combination of these measures provides a comprehensive control framework that is applied to our business divisions and Corporate Center, as well as the significant legal entities, as relevant to the key risks arising from their businesses.

We apply limits to a variety of exposures at the portfolio level, using statistical and stress-based measures, such as value-at-risk, liquidity-adjusted stress, loan underwriting limits, economic value sensitivity and portfolio default simulations for our loan books. These are complemented with a set of controls for net interest income sensitivity, mark-to-market losses on available-for-sale portfolios, and the effect of foreign exchange movements on capital and capital ratios.

Portfolio measures are supplemented with position-level controls. Risk measures for position controls are based on market risk sensitivities and counterparty-level credit risk exposures. Market risk sensitivities include sensitivities to changes in general market risk factors, such as equity indices, foreign exchange rates and interest rates, and sensitivities to issuer-specific factors, such as changes in an issuer's credit spread or default risk. We monitor a significant number of market risk controls for the Investment Bank and Corporate Center on a daily basis. Counterparty measures capture the current and potential future exposure to an individual counterparty, taking into account collateral and legally enforceable netting agreements.

→ **Refer to "Credit risk" in this section for more information about counterparty limits**

Risk concentrations

Audited | A risk concentration exists where (i) a position is affected by changes in a group of correlated factors, or a group of positions are affected by changes in the same risk factor or a group of correlated factors, and (ii) the exposure could, in the event of large but plausible adverse developments, result in significant losses. The categories in which risk concentrations may occur include counterparties, industries, legal entities, countries or geographical regions, products and businesses.

The identification of risk concentrations requires judgment, as potential future developments cannot be accurately predicted and may vary from period to period. In determining whether we have a risk concentration, we consider a number of elements, both individually and collectively. These elements include the shared characteristics of the positions and our counterparties, the size of the position or group of positions, the sensitivity of the position or group of positions to changes in risk factors and the volatility, and the correlations of those factors. Also important in our assessment is the liquidity of the markets where the positions are traded, as well as the availability and effectiveness of hedges or other potential risk-mitigating factors. The value of a hedging instrument may not always move in line with the position being hedged, and this mismatch is referred to as basis risk. In addition, operational risk concentrations may result from a single issue that is large on its own (i.e., has the potential to produce a single high-impact loss or a number of losses that, aggregated together, are high-impact) or related issues that may link together to create a high impact.

Risk concentrations are subject to increased oversight by Risk Control and are assessed to determine whether they should be reduced or mitigated, depending on the available means to do so. It is possible that material losses could occur on asset classes, positions and hedges, particularly if the correlations that emerge in a stressed environment differ markedly from those envisaged by our risk models. ▲

→ **Refer to "Credit risk" and "Market risk" in this section for more information about the compositions of our portfolios**

→ **Refer to the "Risk factors" section of this report for more information**

Credit risk

Key developments

Total net credit loss expenses were USD 78 million in 2019, reflecting net credit loss expenses of USD 100 million related to credit-impaired (stage 3) positions, mainly in Personal & Corporate Banking and to a lesser extent in the Investment Bank and Global Wealth Management, partly offset by USD 22 million of net releases in expected credit loss (ECL) expense allowances and provisions from stage 1 and 2 positions.

→ **Refer to "Note 1 Summary of significant accounting policies," "Note 10 Financial assets at amortized cost and other positions in scope of expected credit loss measurement" and "Note 23 Expected credit loss measurement" in the "Consolidated financial statements" section of this report for more information about IFRS 9 and ECLs**

Our Swiss lending portfolios, which account for approximately half of our loan exposure, continued to perform well. We aim to manage our Swiss lending portfolios prudently and remain watchful for signs of deterioration in the Swiss economy that could affect our counterparties.

Within the Investment Bank, our leveraged loan underwriting business's overall ability to distribute risk remained sound.

Audited | Main sources of credit risk

- A substantial portion of our lending exposure arises from our Swiss domestic business, which offers mortgage loans, secured mainly by residential properties and income-producing real estate, as well as corporate loans, and therefore depends on the performance of the Swiss economy.
- Within the Investment Bank, our credit exposure arises mainly from lending, derivatives trading and securities financing. Derivatives trading and securities financing are predominantly investment grade. Loan underwriting activity can be lower rated and gives rise to concentrated exposure of a temporary nature.
- Our wealth management businesses predominantly conduct securities-based (Lombard) lending and mortgage lending.
- Credit risk within Non-core and Legacy Portfolio in Corporate Center relates to derivative transactions, predominantly carried out on a cash-collateralized basis, and securitized positions. ▲

Audited | Overview of measurement, monitoring and management techniques

- Credit risk arising from transactions with individual counterparties is measured based on our estimates of probability of default, exposure at default and loss given default. Limits are established for individual counterparties and groups of related counterparties covering banking and traded products, as well as settlement amounts. Risk control authorities are approved by the Board of Directors, and are delegated to the Group Chief Executive Officer, the Group Chief Risk Officer and divisional Chief Risk Officers based on risk exposure amounts, internal credit rating and potential loss.
- Limits apply not only to the current outstanding amount, but also to contingent commitments and the potential future exposure of traded products.
- For the Investment Bank, our monitoring, measurement and limit framework distinguishes between exposures intended to be held to maturity (take-and-hold exposures) and those that are intended to be held for a short term, pending distribution or risk transfer (temporary exposures).
- We also use models to derive portfolio credit risk measures of expected loss, statistical loss and stress loss at the Group-wide and business division levels and to establish portfolio limits at these levels.
- Credit risk concentrations can arise if clients are engaged in similar activities, are located in the same geographical region or have comparable economic characteristics; for example, if their ability to meet contractual obligations would be similarly affected by changes in economic, political or other conditions. To avoid credit risk concentrations, we establish limits and/or operational controls that constrain risk concentrations at the portfolio and sub-portfolio levels with regard to sector exposure, country risk and specific product exposures. ▲

Credit risk profile of the Group

The exposures detailed in this section are based on our internal management view of credit risk, which differs in certain respects from the ECL measurement requirements of IFRS.

Internally, we categorize credit risk exposures into two broad categories: banking products and traded products. Banking products comprise drawn loans, guarantees and loan commitments, amounts due from banks, balances at central banks and other financial assets at amortized cost. Traded products comprise over-the-counter derivatives, exchange-traded derivatives and securities financing transactions, comprised of securities borrowing and lending, as well as repurchase and reverse repurchase agreements.

Banking products

The breakdowns of our banking products exposures in the "Banking and traded products exposure in our business divisions and Corporate Center" table below and on the next page are shown gross before allowances and provisions for expected credit losses and related single-name credit hedges. The effect of portfolio hedges, such as index credit default swaps, is not reflected. Guarantees and loan commitments are shown on a notional basis, without applying credit conversion factors. The gross exposure for banking products of USD 515 billion corresponds to the ECL gross exposure of USD 670 billion, including other financial assets measured at amortized cost, but excluding cash, receivables from securities financing transactions, cash collateral receivables on derivative instruments, financial assets at fair value through other comprehensive income (FVOCI), irrevocable committed prolongation of existing loans, unconditionally revocable committed credit lines, and forward starting reverse repurchase and securities borrowing agreements.

The table reflects the total exposures (stages 1–3) in scope of ECL requirements, allowances and provisions by ECL stages and separately credit-impaired exposures, gross (stage 3). Total gross banking products exposure was USD 515 billion as of 31 December 2019, compared with USD 518 billion at the end of the prior year.

→ **Refer to "Note 1 Summary of significant accounting policies" in the "Consolidated financial statements" section of this report for more information about our accounting policy for allowances and provisions for ECLs**

→ **Refer to "Note 10 Financial assets at amortized cost and other positions in scope of expected credit loss measurement" and "Note 23 Expected credit loss measurement" in the "Consolidated financial statements" section of this report for more information about ECL measurement requirements under IFRS**

→ **Refer to "Note 17a Other financial assets measured at amortized cost" in the "Consolidated financial statements" section of this report for more details**

Banking and traded products exposure in our business divisions and Corporate Center

	31.12.19					
USD million	Global Wealth Management	Personal & Corporate Banking	Asset Management	Investment Bank	Corporate Center	Group
Banking products[1,2]						
Gross exposure	239,032	194,395	2,914	48,170	30,570	515,081
of which: loans and advances to customers (on-balance sheet)	*174,510*	*136,572*	*1*	*10,585*	*5,882*	*327,550*
of which: guarantees and loan commitments (off-balance sheet)	*5,578*	*23,142*	*0*	*16,009*	*960*	*45,689*
Traded products[2,3]						
Gross exposure	8,830	841	0	38,233		47,904
of which: over-the-counter derivatives	*6,571*	*804*	*0*	*9,832*		*17,207*
of which: securities financing transactions	*0*	*0*	*0*	*20,821*		*20,821*
of which: exchange-traded derivatives	*2,259*	*36*	*0*	*7,580*		*9,876*
Other credit lines, gross[4]	10,735	20,986	0	3,227	144	35,092
Total credit-impaired exposure, gross (stage 3)[1]	902	1,694	0	91	427	3,113
Total allowances and provisions for expected credit losses (stages 1 to 3)	209	696	0	87	37	1,029
of which: stage 1	*59*	*81*	*0*	*38*	*3*	*181*
of which: stage 2	*34*	*122*	*0*	*3*	*0*	*160*
of which: stage 3 (allowances and provisions for credit-impaired exposures)	*116*	*493*	*0*	*46*	*34*	*688*

Banking and traded products exposure in our business divisions and Corporate Center (continued)

	31.12.18[5]					
USD million	Global Wealth Management	Personal & Corporate Banking	Asset Management	Investment Bank	Corporate Center	Group
Banking products[1]						
Gross exposure	239,835	186,802	2,751	59,980	28,357	517,725
of which: loans and advances to customers (on-balance sheet)	*170,413*	*133,253*	*7*	*9,090*	*8,362*	*321,125*
of which: guarantees and loan commitments (off-balance sheet)	*6,111*	*20,609*	*0*	*22,290*	*348*	*49,358*
Traded products[2,3]						
Gross exposure	10,606	873	0	30,771		42,250
of which: over-the-counter derivatives	*5,960*	*762*	*0*	*9,441*		*16,163*
of which: securities financing transactions	*153*	*0*	*0*	*16,004*		*16,157*
of which: exchange-traded derivatives	*4,494*	*111*	*0*	*5,325*		*9,930*
Other credit lines, gross[4]	10,345	22,994	0	3,202	94	36,634
Total credit-impaired exposure, gross (stage 3)[1]	625	1,974	0	140	415	3,154
Total allowances and provisions for expected credit losses (stages 1 to 3)	223	697	0	108	26	1,054
of which: stage 1	*62*	*78*	*0*	*34*	*3*	*176*
of which: stage 2	*34*	*146*	*0*	*3*	*0*	*183*
of which: stage 3 (allowances and provisions for credit-impaired exposures)	*127*	*474*	*0*	*71*	*23*	*695*

1 ECL gross exposure including other financial assets at amortized cost, but excluding cash, receivables from securities financing transactions, cash collateral receivables on derivative instruments, financial assets at FVOCI, irrevocable committed prolongation of existing loans and unconditionally revocable committed credit lines and forward starting reverse repurchase and securities borrowing agreements. 2 Internal management view of credit risk, which differs in certain respects from IFRS. 3 As counterparty risk for traded products is managed at counterparty level, no further split between exposures in the Investment Bank and Corporate Center is provided. 4 Unconditionally revocable committed credit lines. 5 The comparative figures have been restated for the changes in Corporate Center resource allocation to the business divisions. Refer to the "Significant accounting and financial reporting changes" section of this report for more information.

Global Wealth Management

Gross banking products exposure within Global Wealth Management decreased slightly to USD 239 billion from USD 240 billion.

Our Global Wealth Management loan portfolio is mainly secured by securities (Lombard loans) and by residential property. Most of the Lombard loans were of high quality, with 96% rated as investment grade based on our internal ratings, and they are typically short term in nature, with an average duration of three to six months. Moreover, Lombard loans can be canceled immediately, if the collateral quality deteriorates or margin calls are not met.

The portfolio of mortgage loans secured by properties in EMEA and Asia Pacific decreased to USD 6.4 billion from USD 6.5 billion. The overall quality of this portfolio remained high during the year.

In Global Wealth Management Region Americas the portfolio of loans secured by residential property consists primarily of residential mortgage loans offered in the US. Gross exposure increased to USD 17.2 billion from USD 14.3 billion. The overall quality of this portfolio remained high, with an average loan-to-value (LTV) ratio of 59.1%, compared with 58.7% (the comparative figure has been restated) as of 31 December 2018, and we have experienced negligible credit losses since the inception of the mortgage program in 2009. The five largest geographic concentrations in the portfolio were in California (27%), New York (14%), Florida (10%), Texas (5%) and New Jersey (4%).

Global Wealth Management and Personal & Corporate Banking loans and advances to customers, gross

	Global Wealth Management		Personal & Corporate Banking	
USD million	31.12.19	31.12.18	31.12.19	31.12.18
Secured by residential property	54,383	51,251	100,645	96,841
Secured by commercial / industrial property	2,619	2,233	17,131	16,887
Secured by cash	16,852	15,529	1,569	1,467
Secured by securities	88,684	90,946	1,766	1,647
Secured by guarantees and other collateral	10,591	9,469	5,351	5,754
Unsecured loans and advances to customers	1,381	986	10,111	10,657
Total loans and advances to customers, gross	174,510	170,413	136,572	133,253
Allowances	(93)	(102)	(595)	(594)
Total loans and advances to customers, net of allowances	174,417	170,312	135,978	132,659

Personal & Corporate Banking

Gross banking products exposure (excluding exposure re-allocated from Group Treasury) within Personal & Corporate Banking increased to USD 163 billion (CHF 158 billion) from USD 157 billion (CHF 155 billion), partly driven by the appreciation of the Swiss franc. Net banking products exposure was USD 162 billion (CHF 157 billion), compared with USD 157 billion (CHF 154 billion), of which approximately 63% was classified as investment grade, similar to 2018. Around 50% of the exposure is categorized in the lowest loss given default (LGD) bucket of 0–25%, similar to 2018. The size of Personal & Corporate Banking's gross loan portfolio increased by USD 3 billion (CHF 1 billion) to USD 137 billion (CHF 132 billion). As of 31 December 2019, 93% of this portfolio was secured by collateral, mainly residential and commercial property. Of the total unsecured amount, 79% related to cash flow-based lending to corporate counterparties and 5% related to lending to public authorities. Based on our internal ratings, 46% of the unsecured loan portfolio was rated as investment grade, compared with 47% in 2018.

Credit loss expense for banking products remained low in 2019.

Our Swiss corporate banking products portfolio, which was USD 26 billion (CHF 26 billion) compared with USD 27 billion (CHF 27 billion) in 2018, consists of loans, guarantees and loan commitments to multi-national and domestic counterparties. The small and medium-sized enterprises portfolio, in particular, is well diversified across industries. However, such companies are reliant on the domestic economy and the economies to which they export, in particular the EU and the US. In addition, the development of the EUR / CHF exchange rate is an important risk factor for Swiss corporate clients.

The delinquency ratio was 0.5% for the corporate portfolio, compared with 0.3% at the end of 2018.

→ **Refer to "Credit risk models" in this section for more information about loss given default, rating grades and rating agency mappings**

Swiss mortgage loan portfolio

Our Swiss mortgage loan portfolio secured by residential and commercial real estate in Switzerland continues to be our largest loan portfolio. These mortgage loans, totaling USD 146 billion (CHF 141 billion), mainly originate from Personal & Corporate Banking, but also from Global Wealth Management Region Switzerland. USD 133 billion (CHF 129 billion) of those mortgage loans related to residential properties that the borrower was either occupying or renting out, with full recourse to the borrower. Of this USD 133 billion (CHF 129 billion), USD 97 billion (CHF 94 billion) is related to properties occupied by the borrower, with an average LTV ratio of 54%, compared with 56% as of 31 December 2018. The average LTV for newly originated loans for this portion was 65%, compared with 66% in 2018. The remaining USD 36 billion (CHF 35 billion) of the Swiss residential mortgage loan portfolio relates to properties rented out by the borrower and the average LTV of that portfolio was 54%, compared with 55% as of 31 December 2018. The average LTV for newly originated Swiss residential mortgage loans for properties rented out by the borrower was 58%, compared with 57% in 2018.

As illustrated in the "Swiss mortgages: distribution of net exposure at default (EAD) across exposure segments and loan-to-value (LTV) buckets" table on the next page, more than 99% of the aggregate amount of Swiss residential mortgage loans would continue to be covered by the real estate collateral even if the value assigned to that collateral were to decrease by 20%, and 98% would remain covered by the real estate collateral even if the value assigned to that collateral were to decrease by 30%. In this table, the amount of each mortgage loan is allocated across the LTV buckets to indicate the portion at risk at the various value levels shown. For example, a loan of 75 with an LTV ratio of 75% (i.e., a collateral value of 100) would result in allocations of 30 in the less-than-30% LTV bucket, 20 in the 31–50% bucket, 10 in the 51–60% bucket, 10 in the 61–70% bucket and 5 in the 71–80% bucket.

Personal & Corporate Banking: distribution of banking products exposure across internal UBS ratings and loss given default (LGD) buckets[1]

USD million, except where indicated	31.12.19						31.12.18	
		LGD buckets				Weighted average LGD (%)		Weighted average LGD (%)[3]
Internal UBS rating[2]	Exposure	0–25%	26–50%	51–75%	76–100%		Exposure[3]	
Investment grade	102,491	58,331	34,250	8,314	1,597	27	97,854	27
Sub-investment grade	58,597	23,937	21,368	11,287	2,005	34	57,350	35
of which: 6–9	*53,811*	*21,715*	*19,783*	*10,502*	*1,812*	*34*	*53,130*	*34*
of which: 10–13	*4,786*	*2,222*	*1,585*	*785*	*193*	*32*	*4,220*	*35*
Defaulted / Credit-impaired	1,694	33	1,409	252	0	40	1,974	37
Total exposure before deduction of allowances and provisions	162,782	82,302	57,026	19,852	3,602	29	157,178	30
Less: allowances and provisions	(660)						(663)	
Net banking products exposure[1]	162,121						156,515	

1 Excluding balances at central banks and Group Treasury reallocations. 2 The ratings of the major credit rating agencies, and their mapping to our internal rating scale, are shown in the "Internal UBS rating scale and mapping of external ratings" table in this section. 3 Exposure and weighted average LGD have been restated.

Personal & Corporate Banking: unsecured loans by industry sector

	31.12.19		31.12.18	
	USD million	%	USD million	%
Construction	135	1.3	133	1.2
Financial institutions	1,873	18.5	2,139	20.1
Hotels and restaurants	81	0.8	79	0.7
Manufacturing	1,536	15.2	1,632	15.3
Private households	1,609	15.9	1,489	14.0
Public authorities	497	4.9	709	6.7
Real estate and rentals	236	2.3	170	1.6
Retail and wholesale	1,981	19.6	2,274	21.3
Services	1,850	18.3	1,774	16.6
Other	313	3.1	257	2.4
Exposure, gross	10,111	100.0	10,657	100.0

Swiss mortgages: distribution of net exposure at default (EAD) across exposure segments and loan-to-value (LTV) buckets

USD billion, except where indicated		31.12.19								31.12.18
		LTV buckets								
Exposure segment		≤30%	31–50%	51–60%	61–70%	71–80%	81–100%	>100%	Total	Total
Residential mortgages	Net EAD	76.0	34.5	10.0	5.2	1.7	0.2	0.1	127.7	123.4
	as a % of row total	60	27	8	4	1	0	0	100	
Income-producing real estate	Net EAD	12.0	4.7	1.1	0.6	0.2	0.0	0.0	18.7	17.9
	as a % of row total	64	25	6	3	1	0	0	100	
Corporates	Net EAD	6.1	2.3	0.6	0.3	0.1	0.1	0.0	9.6	9.0
	as a % of row total	64	24	6	3	2	1	0	100	
Other segments	Net EAD	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.7	0.7
	as a % of row total	66	20	6	4	2	2	0	100	
Mortgage-covered exposure	Net EAD	94.6	41.7	11.8	6.1	2.1	0.4	0.1	156.7	151.0
	as a % of total	60	27	8	4	1	0	0	100	
Mortgage-covered exposure 31.12.18	Net EAD	89.9	40.6	11.6	6.1	2.3	0.4	0.0	151.0	
	as a % of total	60	27	8	4	2	0	0	100	

Asset Management

Gross banking products exposure within Asset Management was USD 2.9 billion as of 31 December 2019, compared with USD 2.8 billion as of 31 December 2018. Banking products relate primarily to balances at central banks and to a lesser extent to cash at banks held by individual Asset Management legal entities, liquid assets and receivables.

Investment Bank

The Investment Bank's lending activities are largely associated with corporate and non-bank financial institutions. The business is broadly diversified across industry sectors, but concentrated in North America.

The gross banking products exposure including balances at central banks and Group Treasury reallocations as of 31 December 2019 was USD 48 billion, compared with USD 60 billion as of 31 December 2018. Gross banking products exposure excluding balances at central banks and Group Treasury reallocations decreased to USD 32 billion from USD 40 billion, mostly driven by reductions in guarantees and loan commitments. Based on our internal ratings, 54% of this gross banking products exposure was classified as investment grade. The vast majority of the gross banking products exposure had an estimated LGD below 50%.

Our loan underwriting business's overall ability to distribute risk remained sound. Total temporary loan underwriting exposure ended 2019 at USD 4.8 billion, USD 2.5 billion higher than the prior year. Loan underwriting exposures are classified as held for trading, with fair values reflecting market conditions at the end of 2019.

→ **Refer to "Credit risk models" in this section for more information about loss given default, rating grades and rating agency mappings**

Investment Bank: distribution of banking products exposure across internal UBS ratings and loss given default (LGD) buckets[1]

USD million, except where indicated	31.12.19						31.12.18	
		LGD buckets				Weighted average LGD (%)		Weighted average LGD (%)
Internal UBS rating[2]	Exposure	0–25%	26–50%	51–75%	76–100%		Exposure	
Investment grade	17,541	4,485	9,853	2,111	1,091	40	24,239	39
Sub-investment grade	14,598	4,796	4,272	5,465	64	18	15,490	15
of which: 6–9	*10,746*	*3,421*	*2,141*	*5,121*	*64*	*14*	*12,169*	*11*
of which: 10–13	*3,852*	*1,376*	*2,132*	*344*	*0*	*30*	*3,321*	*29*
Defaulted / Credit-impaired	91	26	25	27	13	40	140	36
Banking products exposure[1]	32,229	9,307	14,150	7,604	1,168	30	39,869	30

1 Excluding balances at central banks and Group Treasury reallocations. 2 The ratings of the major credit rating agencies, and their mapping to our internal rating scale, are shown in the "Internal UBS rating scale and mapping of external ratings" table in this section.

Investment Bank: banking products exposure by geographical region[1]

	31.12.19		31.12.18	
	USD million	%	USD million	%
Asia Pacific	5,080	15.8	6,123	15.4
Latin America	844	2.6	1,170	2.9
Middle East and Africa	467	1.5	471	1.2
North America	16,553	51.4	18,865	47.3
Switzerland	779	2.4	2,588	6.5
Rest of Europe	8,505	26.4	10,652	26.7
Exposure[1]	32,229	100.0	39,869	100.0

1 Excluding balances at central banks and Group Treasury reallocations.

Investment Bank: banking products exposure by industry sector[1]

	31.12.19		31.12.18	
	USD million	%	USD million	%
Banks	5,375	16.7	6,779	17.0
Chemicals	766	2.4	711	1.8
Electricity, gas, water supply	534	1.7	1,765	4.4
Financial institutions, excluding banks	12,944	40.2	14,488	36.3
Manufacturing	1,705	5.3	2,342	5.9
Mining	1,699	5.3	1,759	4.4
Public authorities	872	2.7	706	1.8
Real estate and construction	1,291	4.0	1,553	3.9
Retail and wholesale	1,842	5.7	2,488	6.2
Technology and communications	2,302	7.1	2,372	5.9
Transport and storage	458	1.4	719	1.8
Other	2,441	7.6	4,188	10.5
Exposure[1]	32,229	100.0	39,869	100.0

1 Excluding balances at central banks and Group Treasury reallocations.

Corporate Center

Gross banking products exposure within Corporate Center, which arises primarily in connection with treasury activities, increased by USD 2 billion to USD 31 billion.

→ **Refer to "Balance sheet assets" in the "Treasury management" section of this report for more information**

→ **Refer to the "Corporate Center" section under "Financial and operating performance" of this report for more information**

Traded products

Audited | Counterparty credit risk arising from traded products, which include over-the-counter (OTC) derivatives, exchange-traded derivatives (ETD) exposures and securities financing transactions (SFTs) originating in the Investment Bank, Non-core and Legacy Portfolio and Group Treasury is generally managed on a close-out basis. This takes into account the possible effect of market movements on the exposure and any associated collateral over the time it would take to close out our positions. In the Investment Bank, limits are applied to the potential future exposure per counterparty, with the size of the limit driven by the view of the creditworthiness of the counterparty as determined by Credit Risk Control. Limit frameworks are also applied to control overall exposure to specific classes or categories of collateral on a portfolio level. Such portfolio limits are monitored and reported to senior management.

Trading in OTC derivatives is conducted through central counterparties (CCPs) where practicable. Where CCPs are not used, we have clearly defined policies and processes for trading on a bilateral basis. Trading is typically conducted under bilateral International Swaps and Derivatives Association (ISDA) or similar master netting agreements, which generally allow for the close-out and netting of transactions in the event of default subject to applicable law. For most major market participant counterparties, we employ two-way collateral agreements under which either party can be required to provide collateral in the form of cash or marketable securities when the exposure exceeds specified levels. This collateral typically consists of well-rated government debt or other collateral permitted by applicable regulations. For certain counterparties, an initial margin is taken to cover some or all of the calculated close-out exposure. This is in addition to the variation margin taken to settle changes in the market value of transactions. Regulations governing the margining of uncleared OTC derivatives continue to evolve. These generally expand the scope of bilateral derivatives activity subject to margining. In addition, they will result in greater amounts of initial margin received from, and posted to, certain bilateral trading counterparties than had been required in the past. These changes should result in lower close-out risk over time. ▲

→ **Refer to "Note 11 Derivative instruments" in the "Consolidated financial statements" section of this report for more information about our over-the-counter derivatives settled through central counterparties**

→ **Refer to "Note 25 Offsetting financial assets and financial liabilities" in the "Consolidated financial statements" section of this report for more information about the effect of netting and collateral arrangements on our derivative exposures**

Credit risk arising from traded products, after the effects of master netting agreements but excluding credit valuation adjustments and hedges, increased by USD 6 billion to USD 48 billion as of 31 December 2019. OTC derivatives accounted for USD 17 billion, exposures from SFTs were USD 21 billion, and ETD exposures amounted to USD 10 billion. OTC derivatives exposures are generally measured as net positive replacement values after the application of legally enforceable netting agreements and the deduction of cash and marketable securities held as collateral. SFT exposures are reported taking into account collateral received, and ETD exposures take into account collateral margin calls.

The majority of the gross traded products exposures were within the Investment Bank, Non-core and Legacy Portfolio, and Group Treasury, totaling USD 38 billion, compared with USD 31 billion as of 31 December 2018. As counterparty risk for traded products is managed at the counterparty level, no further split is provided between exposures in the Investment Bank and those in Non-core and Legacy Portfolio and Group Treasury. The traded products exposure includes OTC derivatives gross exposures of USD 10 billion in the Investment Bank and Non-core and Legacy Portfolio, an increase of USD 0.4 billion from the prior year. During 2019, SFT exposures increased by USD 5 billion to USD 21 billion, mainly due to increases in trading relationships and in posted collateral. ETD exposures increased by USD 2 billion to USD 8 billion. The tables on the next page provide more information about the OTC derivatives, SFT and ETD exposures of the Investment Bank, Non-core and Legacy Portfolio and Group Treasury.

Investment Bank, Non-core and Legacy Portfolio and Group Treasury: traded products exposure

USD million	OTC derivatives	SFTs	ETD	Total	Total
		31.12.19			31.12.18
Total exposure, before deduction of credit valuation adjustments and hedges	9,830	20,821	7,580	38,232	30,769
Less: credit valuation adjustments and allowances	(38)			(38)	(136)
Less: credit protection bought (credit default swaps, notional)	(242)			(242)	(288)
Net exposure after credit valuation adjustments, allowances and hedges	**9,550**	**20,821**	**7,580**	**37,952**	**30,346**

Investment Bank, Non-core and Legacy Portfolio and Group Treasury: distribution of net OTC derivatives and SFT exposure across internal UBS ratings and loss given default (LGD) buckets

USD million, except where indicated	31.12.19						31.12.18	
		LGD buckets						
Internal UBS rating[1]	Exposure	0–25%	26–50%	51–75%	76–100%	Weighted average LGD (%)	Exposure	Weighted average LGD (%)
Net OTC derivatives exposure								
Investment grade	9,247	189	7,488	1,379	191	47	8,737	46
Sub-investment grade	304	32	55	182	34	56	280	54
of which: 6–9	*176*	*18*	*52*	*75*	*31*	*57*	*242*	*56*
of which: 10–12	*112*	*0*	*4*	*107*	*1*	*58*	*19*	*45*
of which: 13 and defaulted	*16*	*14*	*0*	*0*	*2*	*19*	*19*	*37*
Total net OTC derivatives exposure, after credit valuation adjustments and hedges	**9,550**	**221**	**7,543**	**1,561**	**225**	**47**	**9,016**	**47**
Net SFT exposure								
Investment grade	20,524	1	18,397	1,737	388	40	15,668	41
Sub-investment grade	297	0	174	34	90	62	336	63
Total net SFT exposure	**20,821**	**1**	**18,571**	**1,772**	**478**	**40**	**16,004**	**41**

1 The ratings of the major credit rating agencies, and their mapping to our internal rating scale, are shown in the "Internal UBS rating scale and mapping of external ratings" table in this section.

Investment Bank, Non-core and Legacy Portfolio and Group Treasury: net OTC derivatives and SFT exposure by geographical region

	Net OTC derivatives				Net SFT exposure			
	31.12.19		31.12.18		31.12.19		31.12.18	
	USD million	%	USD million	%	USD million	%	USD million	%
Asia Pacific	1,383	14.5	1,309	14.5	5,055	24.3	3,408	21.3
Latin America	97	1.0	104	1.2	4	0.0	62	0.4
Middle East and Africa	123	1.3	109	1.2	900	4.3	549	3.4
North America	2,421	25.3	2,621	29.1	4,714	22.6	3,014	18.8
Switzerland	1,022	10.7	276	3.1	852	4.1	1,375	8.6
Rest of Europe	4,503	47.2	4,597	51.0	9,297	44.7	7,597	47.5
Exposure	**9,550**	**100.0**	**9,016**	**100.0**	**20,821**	**100.0**	**16,004**	**100.0**

Investment Bank, Non-core and Legacy Portfolio and Group Treasury: net OTC derivatives and SFT exposure by industry sector

	Net OTC derivatives				Net SFT exposure			
	31.12.19		31.12.18		31.12.19		31.12.18	
	USD million	%	USD million	%	USD million	%	USD million	%
Banks	4,608	48.3	3,813	42.3	3,713	17.8	3,495	21.8
Chemicals	4	0.0	5	0.1	0	0.0	0	0.0
Electricity, gas, water supply	99	1.0	87	1.0	0	0.0	0	0.0
Financial institutions, excluding banks	3,188	33.4	3,425	38.0	15,593	74.9	11,404	71.3
Manufacturing	67	0.7	89	1.0	0	0.0	0	0.0
Mining	9	0.1	12	0.1	0	0.0	0	0.0
Public authorities	1,019	10.7	1,198	13.3	1,514	7.3	1,102	6.9
Retail and wholesale	17	0.2	10	0.1	0	0.0	0	0.0
Transport, storage and communication	383	4.0	284	3.1	0	0.0	0	0.0
Other	156	1.6	92	1.0	0	0.0	3	0.0
Exposure	**9,550**	**100.0**	**9,016**	**100.0**	**20,821**	**100.0**	**16,004**	**100.0**

Credit risk mitigation

Audited | We actively manage the credit risk in our portfolios by taking collateral against exposures and by utilizing credit hedging. ▲

Lending secured by real estate

Audited | We use a scoring model as part of a standardized front-to-back process to support credit decisions for the origination or modification of Swiss mortgage loans. The two key factors within this model are an affordability calculation relative to gross income and the loan-to-value (LTV) ratio. ▲

The calculation of affordability takes into account interest payments, minimum amortization requirements, potential property maintenance costs and, in the case of properties expected to be rented out, the level of rental income. Interest payments are estimated using a predefined framework, which takes into account the potential for significant increases in interest rates during the lifetime of the loan. The interest rate is set at 5% per annum.

For residential properties occupied by the borrower, the maximum LTV allowed within the standard approval process is 80%. This is reduced to 60% in the case of vacation properties and luxury real estate. For other properties, the maximum LTV allowed within the standard approval process ranges from 30% to 80%, depending on the type of property, the age of the property and the amount of renovation work required.

Audited | The value assigned by UBS to each property is based on the lowest value determined from internally calculated valuations, the purchase price and, in some cases, an additional external valuation. ▲

We use two separate models provided by a market-leading external vendor to derive property valuations for owner-occupied residential properties (ORP) and income-producing real estate. For ORP, we estimate the current value of properties by using a regression model (a hedonic model) to compare detailed characteristics for each property against a database of property transactions. In addition to the model-derived values, valuations for ORP are updated quarterly throughout the lifetime of the loan by using region-specific real estate price indices. The price indices are sourced from an external vendor and are subject to internal validation and benchmarking against two other external vendors. On a quarterly basis, we use these valuations to compute indexed LTV for all ORP and consider these together with other risk measures (e.g., rating migration and behavioral information) to identify higher-risk loans, which are then reviewed individually by client advisors and credit officers, with action taken where considered necessary.

For income-producing real estate, the capitalization model is used to determine the property valuation by discounting estimated sustainable future income using a capitalization rate based on various attributes. These attributes consider regional as well as specific property characteristics, such as market and location data (e.g., vacancy rates), benchmarks (e.g., for running costs) and certain other standardized input parameters (e.g., property condition). Rental income from properties is reviewed at a minimum once every three years, but indications of significant changes in the amount of rental income or in the vacancy rate can trigger an interim reappraisal.

To take market developments into account for these models, the external vendor regularly updates the parameters and/or refines the architecture for each model. Model changes and parameter updates are subject to the same validation procedures as our internally developed models.

Audited | We similarly apply underwriting guidelines for our Global Wealth Management Region Americas mortgage loan portfolio, taking into account affordability of the loans and sufficiency of collateral. The maximum LTV within the standard approval process for any type of mortgage is 80%. A stratification of LTVs exists for the various mortgage types, such as residential mortgage or investment property, based on associated risk factors, such as property types, loan size and loan purpose. Maximum LTVs go as low as 45%. Additionally, other credit risk metrics are applied, based upon property and borrower characteristics, such as debt-to-income ratios, FICO credit scores and required client reserves.

A risk limit framework is applied to the Global Wealth Management Region Americas mortgage loan portfolio. Limits have been established to govern exposures within LTV categories, geographic concentrations, portfolio growth and high-risk mortgage segments, such as interest-only loans. These limits are monitored by a specialized credit risk monitoring team and reported to senior management. Supplementing this limit framework is a real estate lending policy and procedures framework, established to govern the real estate lending activities. Quality assurance and quality control programs are in place to monitor compliance with mortgage underwriting and documentation requirements. ▲

→ **Refer to "Swiss mortgage loan portfolio" in this section for more information about LTV in our Swiss mortgage portfolio**

→ **Refer to "Global Wealth Management" in this section for more information about LTV in our Global Wealth Management Region Americas mortgage portfolio**

Lombard lending

Audited | Lombard loans are secured by pledges of marketable securities, guarantees and other forms of collateral. Eligible financial securities primarily include transferable securities (such as bonds and equities) that are liquid and actively traded, and other transferable securities, such as approved structured products for which regular prices are available and for which the issuer of the security provides a market. To a lesser degree, less liquid collateral is also financed.

We apply discounts (haircuts) to reflect the pledged collateral's risk and to derive the lending value. Haircuts for marketable securities are calculated to cover the possible change in the market value over a given close-out period and confidence level. The haircut applied will vary, depending on the view of the collateral quality. Less liquid or more volatile collateral will typically attract larger haircuts. For less liquid instruments, such as structured products, some bonds and products with long redemption periods, the assumed close-out period may be much longer than that for highly liquid instruments, or an assessment is made as to the expected recovery on the asset in the event of the counterparty's default, resulting in a larger haircut. For cash, life insurance policies, guarantees and letters of credit, haircuts are determined on a product- or client-specific basis.

We also consider concentration and correlation risks across collateral posted at a counterparty level, as well as at a divisional level across counterparties. Additionally, we perform targeted Group-wide reviews of concentrations. A concentration of collateral in single securities, issuers or issuer groups, industry sectors, countries, regions or currencies may result in higher risk and reduced liquidity. In such cases, the lending value of the collateral, margin call and close-out levels are adjusted accordingly. ▲

Exposures and collateral values are monitored on a daily basis with the intention of ensuring that the credit exposure continues to be within the established risk tolerance. A shortfall occurs when the lending value drops below the exposure. If a shortfall exceeds a defined trigger level, a margin call is initiated, requiring the client to provide additional collateral, reduce the exposure or take other action to bring the exposure in line with the agreed lending value of the collateral. If the extent of the shortfall increases and exceeds a further trigger level, or the shortfall is not corrected within the required period, then a close-out is initiated, through which collateral is liquidated, open derivative positions are closed and guarantees are called.

We also conduct stress testing of collateralized exposures to simulate market events that reduce the value of the collateral, increase the exposure of traded products, or both. For certain classes of counterparties, limits on such calculated stress exposures are applied and controlled at a counterparty level. In addition, there are portfolio limits applied across certain businesses or collateral types.

→ **Refer to "Stress loss" in this section for more information about our stress testing**

Credit hedging

Audited | We utilize single-name credit default swaps (CDSs), credit index CDSs, bespoke protection and other instruments to actively manage credit risk in the Investment Bank and Non-core and Legacy Portfolio. This is aimed at reducing concentrations of risk from specific counterparties, sectors or portfolios and, in the case of counterparty credit risk, the profit or loss effect arising from changes in credit valuation adjustments (CVA).

We maintain strict guidelines for taking credit hedges into account for credit risk mitigation purposes. For example, when monitoring exposures against counterparty limits, we do not usually apply certain credit risk mitigants, such as proxy hedges (credit protection on a correlated but different name) or credit index CDSs, to reduce counterparty exposures. Buying credit protection also creates credit exposure with regard to the protection provider. We monitor and limit our exposures to credit protection providers and we also monitor the effectiveness of credit hedges as part of our overall credit exposures to the relevant counterparties. Trading with such counterparties is typically collateralized. For credit protection purchased to hedge the lending portfolio, this includes monitoring mismatches between the maturity of the credit protection purchased and the maturity of the associated loan. Such mismatches result in basis risk and may reduce the effectiveness of the credit protection. Mismatches are routinely reported to credit officers and mitigating actions are taken when deemed necessary. ▲

→ **Refer to "Note 11 Derivative instruments" in the "Consolidated financial statements" section of this report for more information**

Mitigation of settlement risk

To mitigate settlement risk, we reduce our actual settlement volumes through the use of multi-lateral and bilateral agreements with counterparties, including payment netting.

The most significant source of our settlement risk is foreign exchange transactions. We are a member of Continuous Linked Settlement (CLS), an industry utility that provides a multi-lateral framework to settle transactions on a delivery-versus-payment basis, thereby significantly reducing foreign exchange-related settlement risk relative to the volume of business. However, the mitigation of settlement risk through CLS and other means does not fully eliminate our credit risk in foreign exchange transactions resulting from changes in exchange rates prior to settlement, which is managed as part of our overall credit risk management of OTC derivatives.

Credit risk models

Basel III – A-IRB credit risk models

Audited | We have developed tools and models in order to estimate future credit losses that may be implicit in our current portfolio.

Exposures to individual counterparties are measured on the basis of three generally accepted parameters: probability of default (PD); exposure at default (EAD); and loss given default (LGD). For a given credit facility, the product of these three parameters results in the expected loss. These parameters are the basis for the majority of our internal measures of credit risk, and are key inputs for the regulatory capital calculation under the advanced internal ratings-based (A-IRB) approach of the Basel III framework governing international convergence of capital measurement and standards. We also use models to derive the portfolio credit risk measures of expected loss, statistical loss and stress loss. ▲

The "Key features of our main credit risk models" table on the next page shows the number and key features of the models that we use to derive PD, LGD and EAD for our main portfolios and asset classes, and is followed by more detailed explanations of these models and parameters.

→ **Refer to the 31 December 2019 Pillar 3 report, available under "Pillar 3 disclosures" at *www.ubs.com/investors*, for more information about the regulatory capital calculation under the advanced internal ratings-based approach**

Key features of our main credit risk models

	Portfolio in scope	Asset class	Model approach	Number of main models	Main drivers	Number of years loss data[1]
Probability of default	Sovereigns and central banks	Central governments and central banks	Score card	1	Political, institutional and economic indicators	>10
	Owner-occupied mortgages in Switzerland and the US	Retail: residential mortgages	Score card	2	Behavioral data, affordability relative to income, property type, loan-to-value. Separate models for mortgages in Switzerland and the US	25
	Income-producing real estate mortgages	Retail: residential mortgages, Corporates: specialized lending	Score card	1	Loan-to-value, debt service coverage, financial data (for large corporates only), behavioral data; Weights of risk drivers differ between corporate and private clients	25
	Lombard lending	Retail: other	Merton type	1	Loan-to-value, historical asset returns, behavioral data	13
	Small and medium-sized enterprises	Corporates: other lending	Score card	1	Financial data including balance sheet ratios and profit and loss, behavioral data. Weights of risk drivers differ depending on the corporate client sub-segment	25
	Banks	Banks and securities dealers	Score card	4	Financial data including balance sheet ratios and profit and loss. Separate models for banks – developed markets, banks – emerging markets, broker-dealers and investment banks, private banks	12
	Commodity traders	Corporates: specialized lending	Rating template	1	Financial data including balance sheet ratios and profit and loss, as well as non-financial criteria	21
	Aircraft financing	Corporates: other lending	Rating template	1	Financial structure of the transaction	13
	Large corporates	Corporates: other lending	Score card / market data	4	Financial data including balance sheet ratios and profit and loss, and market data. Separate models for corporates with publicly traded and highly liquid stocks (Market Intelligence Tool), private corporates, leveraged corporates and corporates in construction and real estate business	12
	Other portfolios	Corporates: other lending, Public-sector entities and multilateral development banks	Score card / pooled rating approach / rating template	9	Financial data and/or historical portfolio performance for pooled ratings. Separate models for hedge funds, managed funds, insurance companies, commercial real estate loans, mortgage originators, public sector entities and multilateral development banks/supranationals	12
Loss given default	Owner-occupied mortgages in Switzerland and the US	Retail: residential mortgages	Statistical model	2	Loan-to-value, time since last valuation. Separate models for mortgages in Switzerland and the US	11
	Income-producing real estate mortgages	Retail: residential mortgages, Corporates: specialized lending	Statistical model	1	Loan-to-value, time since last valuation, property type, location indicator	11
	Lombard lending	Retail: other	Statistical model, simulation	1	Historical observed loss rates	11
	Small and medium-sized enterprises	Corporates: other lending	Statistical model	2	Separate models for mortgage and non-mortgage LGDs. Mortgage models: loan-to-value, time since last valuation, property type, location indicator. Non-mortgage models: historical observed loss rates	11–17
	Investment Bank – all counterparties	Across the asset classes	Statistical model	2	Counterparty and facility specific, including industry segment, collateral, seniority, legal environment and bankruptcy procedures. Specific model for sovereign LGDs based on econometric modelling of past default events using GDP per capita, government debt, and other quantitative and qualitative factors such as the share of multilateral debt service, the size of the banking sector and institutional quality	5–10
Exposure at default	Banking products	Across the asset classes	Statistical model	3	Separate models based on exposure type (committed credit lines, revocable credit lines, contingent products)	>10
	Traded products	Across the asset classes	Statistical model	2	Product-specific market drivers, e.g., interest rates. Separate models for OTC derivatives, ETDs and SFTs that generate the simulation of risk factors used for the credit exposure measure	n/a

1 For sovereign and Investment Bank PD models, the length of internal portfolio history is shown in Number of years loss data.

Audited |

Internal UBS rating scale and mapping of external ratings

Internal UBS rating	*1-year PD range in %*	*Description*	*Moody's Investors Service mapping*	*Standard & Poor's mapping*	*Fitch mapping*
0 and 1	*0.00–0.02*	*Investment grade*	Aaa	AAA	AAA
2	*0.02–0.05*		Aa1 to Aa3	AA+ to AA–	AA+ to AA–
3	*0.05–0.12*		A1 to A3	A+ to A–	A+ to A–
4	*0.12–0.25*		Baa1 to Baa2	BBB+ to BBB	BBB+ to BBB
5	*0.25–0.50*		Baa3	BBB–	BBB–
6	*0.50–0.80*	*Sub-investment grade*	Ba1	BB+	BB+
7	*0.80–1.30*		Ba2	BB	BB
8	*1.30–2.10*		Ba3	BB–	BB–
9	*2.10–3.50*		B1	B+	B+
10	*3.50–6.00*		B2	B	B
11	*6.00–10.00*		B3	B–	B–
12	*10.00–17.00*		Caa	CCC	CCC
13	*>17*		Ca to C	CC to C	CC to C
Counterparty is in default	*Default*	*Defaulted*		D	D

Probability of default

Probability of default (PD) is an estimate of the likelihood of a counterparty defaulting on its contractual obligations over the next 12 months. PD ratings are used for credit risk measurement and are an important input for determining credit risk approval authorities. For the calculation of risk-weighted assets (RWA), a 3-basis-point PD floor is applied to Banks, Corporates and Retail exposures as required under the Basel III framework. Additionally, for Swiss owner-occupied mortgages we apply an 8-basis-point PD floor and for Lombard loans a 4-basis-point PD floor.

PD is assessed using rating tools tailored to the various categories of counterparties. Statistically developed scorecards, based on key attributes of the obligor, are used to determine PD for many of our corporate clients and for loans secured by real estate. Where available, market data may also be used to derive the PD for large corporate counterparties. For low-default portfolios, where available, we take into account relevant external default data in the rating tool development. For Lombard loans, Merton-type historical return-based model simulations taking into account potential changes in the value of securities collateral are used in our rating approach. These categories are also calibrated to our internal credit rating scale (masterscale), which is designed to ensure a consistent assessment of default probabilities across counterparties. Our masterscale expresses one-year default probabilities that we determine through our various rating tools by means of distinct classes, whereby each class incorporates a range of default probabilities. Counterparties migrate between rating classes as our assessment of their PD changes.

The ratings of the major credit rating agencies, and their mapping to our masterscale and internal PD bands, are shown in the "Internal UBS rating scale and mapping of external ratings" table above. The mapping is based on the long-term average of one-year default rates available from the rating agencies. For each external rating category, the average default rate is compared with our internal PD bands to derive a mapping to our internal rating scale. Our internal rating of a counterparty may therefore diverge from one or more of the correlated external ratings shown in the table. Observed defaults by rating agencies may vary through economic cycles, and we do not necessarily expect the actual number of defaults in our equivalent rating band to equal the rating agencies' average in any given period. We periodically assess the long-term average default rates of credit rating agencies' grades, and we adjust their mapping to our masterscale as necessary to reflect any material changes.

Exposure at default

Exposure at default (EAD) represents the amount we expect to be owed by a counterparty at the time of a possible default. We derive EAD from our current exposure to the counterparty and the possible future development of that exposure.

The EAD of an on-balance sheet loan is its notional amount. For off-balance sheet commitments that are not drawn, credit conversion factors (CCFs) are applied in order to obtain an expected on-balance sheet amount. Such CCFs are based on historical observations. To comply with regulatory guidance, we floor individual observed CCF values at zero in the CCF model; i.e., we assume that the drawn EAD will be no less than the drawn amount one year prior to default.

For traded products, we derive EAD by modeling the range of possible exposure outcomes at various points in time using scenario and statistical techniques. We assess the net amount that may be owed to us or that we may owe to others, taking into account the effect of market movements over the potential time it would take to close out our positions. For ETDs, our calculation of EAD takes into account collateral margin calls. When measuring individual counterparty exposure against credit limits, we consider the maximum likely exposure measured to a high level of confidence. However, when aggregating exposures to different counterparties for portfolio risk measurement purposes, we use the expected exposure to each counterparty at a given time period (usually one year) generated by the same model.

We assess our exposures where there is a material correlation between the factors driving the credit quality of the counterparty and those driving the potential future value of our traded products exposure (wrong-way risk), and we have established specific controls to mitigate such risks.

Loss given default
Loss given default (LGD) is the magnitude of the likely loss if there is a default. Our LGD estimates, which consider downturn conditions, include loss of principal, interest and other amounts (such as workout costs, including the cost of carrying an impaired position during the workout process) less recovered amounts. We determine LGD based on the likely recovery rate of claims against defaulted counterparties, which depends on the type of counterparty and any credit mitigation by way of collateral or guarantees. Our estimates are supported by our internal loss data and external information, where available. Where we hold collateral, such as marketable securities or a mortgage on a property, loan-to-value ratios are typically a key parameter in determining LGD. For low-default portfolios, where available, we take into account relevant external default data in the rating tool development. In the RWA calculation, the regulatory LGD floor of 10% is applied for exposures secured by residential properties. Additionally, we apply a 30% LGD floor for Lombard loans in Global Wealth Management outside Region Americas and a 25% LGD floor for Lombard loans in Global Wealth Management Region Americas. All other LGDs are subject to a 5% floor.

Expected loss
Credit losses are an inherent cost of doing business and the occurrence and amount of credit losses can be erratic. In order to quantify future credit losses that may be implicit in our current portfolio, we use the concept of expected loss. The expected loss for a given credit facility is a product of the three components described above, i.e., PD, EAD and LGD. We aggregate the expected loss for individual counterparties to derive our expected portfolio credit losses.

Expected loss (EL) for regulatory and internal risk control purposes is a statistical measure used to estimate the average annual costs we expect to experience from positions that become impaired. Expected loss is the basis for quantifying credit risk in all our portfolios. We use a statistical modeling approach to estimate the loss profile of each of our credit portfolios over a one-year period to a specified level of confidence. The mean value of this loss distribution is the expected loss. The EL provides an indication of the level of risk in our portfolio and it may change over time. Some parameters have to be estimated on a conservative basis in order to meet the regulatory requirements for banks applying the internal ratings-based approach to determine RWA.

IFRS 9 – ECL credit risk models
The IFRS 9 expected credit loss (ECL) concept differs from our standard credit risk models in some important aspects. The following ECL definitions are generally derivations from our standard credit risk models.

→ **Refer to "Note 1 Summary of significant accounting policies" in the "Consolidated financial statements" section of this report for more information about our accounting policy for allowances and provisions for ECL**

Probability of default
PD represents the likelihood of a default over a specified time period. A 12-month PD represents the likelihood of default determined for the next 12 months and a lifetime PD represents the probability of default over the remaining lifetime of the instrument. The lifetime PD calculation is based on a series of 12-month point-in-time PDs that are derived from through-the-cycle PDs and scenario forecasts. This modeling is region-, industry- and client segment-specific and considers both macroeconomic scenario-dependencies and client-idiosyncratic information. To derive the cumulative lifetime PD per scenario, the series of 12-month point-in-time PDs are transformed into marginal point-in-time PDs, taking into account any assumed default events from prior periods.

Exposure at default
EAD represents an estimate of the exposure to credit risk at the time of a potential default occurring during the life of a financial instrument. It represents the cash flows outstanding at the time of default, considering expected repayments, interest payments and accruals, discounted at the effective interest rate. Future drawdowns on facilities are considered through a CCF that is reflective of historical drawdown and default patterns and the characteristics of the respective portfolios. ECL-specific CCFs have been modeled to capture client segment- and product-specific patterns after removing Basel standard-specific limitations, i.e., conservatism, and focus on a 12-month period prior to default.

Loss given default
LGD represents an estimate of the loss at the time of a potential default occurring during the life of a financial instrument. The determination of the LGD takes into account expected future cash flows from collateral and other credit enhancements, or expected payouts from bankruptcy proceedings for unsecured claims and, where applicable, time to realization of collateral and the seniority of claims. LGD is commonly expressed as a percentage of the relevant EAD.

Expected credit loss

Expected credit losses (ECLs) represent the difference between contractual cash flows and those UBS expects to receive, discounted at the EIR. For loan commitments and other credit facilities in scope of ECL requirements, expected cash shortfalls are determined by considering expected future drawdowns. Rather than focusing on an average through-the-cycle expected annual loss, its purpose is to estimate the amount of losses inherent in a portfolio based on current conditions and future outlook (a point-in-time measure), whereby such forecast has to include all information that is available without undue cost and effort, and address multiple scenarios where there is a perceived non-linearity between changes in economic conditions and their effect on credit losses. From a credit risk modeling perspective, ECL parameters are generally a derivation of the factors assessed for regulatory Basel III EL.

Comparison of Basel III EL and IFRS 9 ECL

Depending on the application, there are a number of key differences in the estimation process and the result thereof. Most notably, regulatory Basel III EL parameters are through-the-cycle / downturn estimates, which might include a margin of conservatism, while IFRS 9 ECL parameters are typically point-in-time, reflecting current economic conditions and future outlook. The main differences are summarized in the table below.

The estimation of expected (credit) loss is not a forecast of the annual charge to *Credit loss expense* resulting from loans and off-balance sheet exposures that become impaired. Basel III EL is not particularly sensitive to prevailing economic conditions with its through-the-cycle / downturn view. ECL, in contrast, is grounded in point-in-time economic conditions, but measured as an average of different scenarios, and for time periods that are dependent on the maturity profile of the book at reporting date and the particular stage classification required by IFRS 9. It does not, therefore, cover a point-in-time credit loss expense expectation measured over a quarter or a calendar year.

Further key aspects of credit risk models

Stress loss

We complement our statistical modeling approach with scenario-based stress loss measures. Stress tests are run on a regular basis to monitor the potential effect of extreme, but nevertheless plausible, events on our portfolios, under which key credit risk parameters are assumed to deteriorate substantially. Where we consider it appropriate, we apply limits on this basis.

In the table below, we illustrate the main differences between the two expected loss measures:

	Basel III EL (advanced internal ratings-based approach)	IFRS 9 ECL
Scope	The Basel III advanced internal ratings-based (A-IRB) approach applies to most credit risk exposures. It includes transactions measured at amortized cost, at fair value through profit or loss and at fair value through OCI, including loan commitments and financial guarantees.	The IFRS 9 expected credit loss (ECL) calculation mainly applies to financial assets measured at amortized cost and debt instruments measured at fair value through OCI, as well as loan commitments and financial guarantee contracts not at fair value through profit or loss.
12-month versus lifetime expected loss	The Basel III A-IRB approach takes into account expected losses resulting from expected default events occurring within the next 12 months.	In the absence of a significant increase in credit risk (SICR), a maximum 12-month ECL is recognized to reflect lifetime cash shortfalls that will result if a default event occurs in the 12 months after the reporting date (or a shorter period if the expected lifetime is less). Once an SICR event has occurred, a lifetime ECL is recognized considering expected default events over the life of the transaction.
Exposure at default (EAD)	EAD is the amount we expect a counterparty to owe us at the time of a possible default. For banking products, the EAD equals the book value as of the reporting date, whereas for traded products, such as securities financing transactions, the EAD is modeled. The EAD is expected to remain constant over the 12-month period. For loan commitments, a credit conversion factor is applied to model expected future drawdowns over the 12-month period, irrespective of the actual maturity of a particular transaction. The credit conversion factor includes downturn adjustments.	EAD is generally calculated on the basis of the cash flows that are expected to be outstanding at the individual points in time during the life of the transaction, discounted to the reporting date using the effective interest rate. For loan commitments, a credit conversion factor is applied to model expected future drawdowns over the life of the transaction without including downturn assumptions. In both cases, the time period is capped at 12 months, unless an SICR has occurred.
Probability of default (PD)	PD estimates are determined on a through-the-cycle (TTC) basis. They represent historical average PDs, taking into account observed losses over a prolonged historical period, and are therefore less sensitive to movements in the underlying economy.	PD estimates will be determined on a point-in-time (PIT) basis, based on current conditions and incorporating forecasts for future economic conditions at the reporting date.
Loss given default (LGD)	LGD includes prudential adjustments, such as downturn LGD assumptions and floors. Similar to PD, LGD is determined on a TTC basis.	LGD should reflect the losses that are reasonably expected and prudential adjustments should therefore not be applied. Similar to PD, LGD is determined on the basis of a PIT approach.
Use of scenarios	N/A	Multiple forward-looking scenarios have to be taken into account to determine a probability-weighted ECL.

Stress scenarios and methodologies are tailored to the nature of the portfolios, ranging from regionally focused to global systemic events, and varying in time horizon. For example, for our loan underwriting portfolio, we apply a global market event under which, simultaneously, the market for loan syndication freezes, market conditions significantly worsen, and credit quality deteriorates. Similarly, for Lombard lending, we apply a range of scenarios representing instantaneous market shocks to all collateral and exposure positions, taking into consideration their liquidity and potential concentrations. The portfolio-specific stress test for our mortgage lending business in Switzerland reflects a multi-year event, and the overarching stress test for global wholesale and counterparty credit risk to corporates uses a one-year global stress event and takes into account exposure concentrations to single counterparties.

→ **Refer to "Stress testing" in this section for more information about our stress testing framework**

Credit risk model confirmation

Our approach to model confirmation involves both quantitative methods, including monitoring compositional changes in the portfolios and the results of backtesting, and qualitative assessments, including feedback from users on the model output as a practical indicator of the performance and reliability of the model.

Material changes in a portfolio composition may invalidate the conceptual soundness of the model. We therefore perform regular analyses of the evolution of portfolios to identify such changes in the structure and credit quality of portfolios. This includes analyses of changes in key attributes, changes in portfolio concentration measures, as well as changes in RWA.

→ **Refer to "Risk measurement" in this section for more information about our approach to model confirmation procedures**

Backtesting

We monitor the performance of our models by backtesting and benchmarking them, whereby model outcomes are compared with actual results, based on our internal experience and externally observed results. To assess the predictive power of our credit exposure models for traded products such as OTC derivatives and ETD products, we statistically compare the predicted future exposure distributions at different forecast horizons with the realized values.

For PD, we use statistical modeling to derive a predicted distribution of the number of defaults. The observed number of defaults is then compared with this distribution, allowing us to derive a statistical level of confidence in the model conservatism. In addition, we derive a lower and upper bound for the average default rate. If the portfolio average PD lies outside the derived interval, the rating tool is, as a general rule, recalibrated.

For LGD, the backtesting statistically tests whether the mean difference between the observed and predicted LGD is zero. If the test fails, there is evidence that our predicted LGD is too low. In such cases, and where these differences are outside expectations, models are recalibrated.

Main credit models backtesting by regulatory asset class

	Length of time series used for the calibration (in years)	Actual rates in %			Estimated average rates at the start of 2019 in %
		Average of last 5 years[1]	Min. of last 5 years[2]	Max. of last 5 years[2]	
Probability of default[3]					
Central governments and central banks	>10[4]	0.00	0.00	0.00	0.17
Banks and securities dealers	>10	0.03	0.00	0.21	0.19
Public-sector entities, multilateral development banks	>10	0.15	0.00	0.53	0.64
Corporates: specialized lending	>10	0.32	0.15	0.60	1.21
Corporates: other lending	>10	0.25	0.21	0.29	0.46
Retail: residential mortgages	>20	0.21	0.12	0.28	0.56
Retail: other	>10	0.00	0.00	0.01	0.30
Loss given default					
Central governments and central banks	>10				51.00
Banks and securities dealers	>10				27.50
Public-sector entities, multilateral development banks	>10				48.70
Corporates: specialized lending	>10	7.40	0.00	34.60	23.20
Corporates: other lending	>10	26.40	8.00	28.00	37.70
Retail: residential mortgages	>20	0.80	0.20	1.70	20.70
Retail: other	>10	29.20	17.90	65.30	27.40
Credit conversion factors					
Corporates	>10	15.80	6.90	44.30	40.20

1 Average of all observations over the last five years. 2 Minimum / maximum annual average of observations in any single year from the last five years. Yearly averages are only calculated where five or more observations occurred during that year. 3 Average PD estimation is based on all rated clients in the portfolio. 4 Sovereign PD model is calibrated to UBS masterscale, length of time series shows span of internal history for this portfolio.

Credit conversion factors (CCFs), used for the calculation of EAD for undrawn facilities with corporate counterparties, are dependent on several contractual dimensions of the credit facility. We compare the predicted amount drawn with observed historical utilization of such facilities for defaulted counterparties. If any statistically significant deviation is observed, the relevant CCFs are redefined.

The "Main credit models backtesting by regulatory asset class" table on the previous page compares the current model calibration for PD, LGD and CCFs with historical observed values over the last five years.

Changes to models and model parameters during the period

As part of our continuous efforts to enhance models to reflect market developments and newly available data, we updated several models in the course of 2019.

In Personal & Corporate Banking and Global Wealth Management, we completed the phasing-in of RWA increases related to PD and LGD changes of the revised models for Swiss residential mortgages that were implemented in 2017. With regard to the EAD, the CCF for zero-balance securities-backed lending and margin loans in Global Wealth Management was changed from 5% to 15%.

Within the Investment Bank, selected portfolios with lower materiality levels and exposures rated by expert judgment were moved to the Standardized Approach for the RWA calculation.

Where required, changes to models and model parameters were approved by the Swiss Financial Market Supervisory Authority (FINMA) prior to implementation.

→ **Refer to "Risk-weighted assets" in the "Capital management" section of this report for more information about the effect of the changes to models and model parameters on credit risk RWA**

Future credit risk-related regulatory capital developments

In December 2017, the Basel Committee on Banking Supervision announced the finalization of the Basel III framework, which we currently expect FINMA to introduce into national law later than the originally communicated effective date of 1 January 2022. The updated framework has made a number of revisions to the internal ratings-based (IRB) approaches, namely: (i) removing the possibility of using the advanced IRB (A-IRB) approach for certain asset classes (including large and medium-sized corporate clients, banks and other financial institutions); (ii) placing floors on certain model inputs under the IRB approach, such as for PD and LGD; and (iii) introducing various requirements to reduce RWA variability (for example, for LGD).

The published framework has a number of requirements that are subject to national discretion. In addition, revisions to the credit valuation adjustment (CVA) framework were published, including the removal of the advanced CVA (A-CVA) approach. UBS maintains a close dialog with FINMA to discuss in more detail the implementation objectives and to prepare for a smooth transition of the capital regime for credit risk.

→ **Refer to "Capital management objectives, planning and activities" in the "Capital management" section of this report for more information about the development of RWA**

→ **Refer to "Risk measurement" in this section for more information about our approach to model confirmation procedures**

→ **Refer to the "Regulatory and legal developments" and "Risk factors" sections of this report for more information**

Credit policies for distressed assets

The "Exposure categorization" chart on the next page illustrates how we categorize banking products and securities financing transactions as non-performing, defaulted, credit-impaired and purchased or originated credit-impaired.

Non-performing

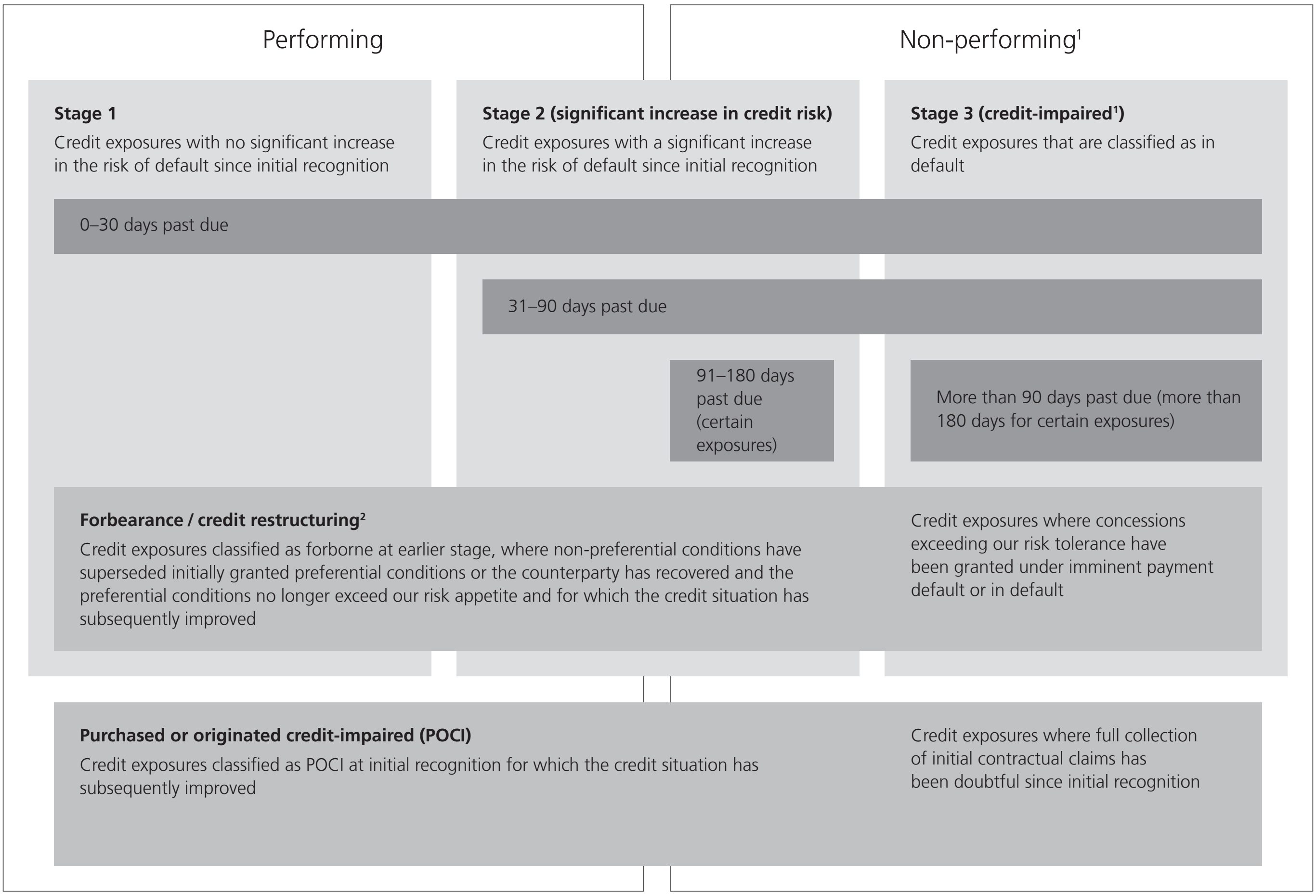
Audited | In line with the regulatory definition, we report a claim as non-performing when: (i) it is more than 90 days past due; (ii) it is subject to restructuring proceedings, where preferential conditions concerning interest rates, subordination, tenor, etc. have been granted in order to avoid default of the counterparty (forbearance); or (iii) the counterparty is subject to bankruptcy / enforced liquidation proceedings in any form, even if there is sufficient collateral to cover the due payment or there is other evidence that payment obligations will not be fully met without recourse to collateral.

Default and credit-impaired

UBS applies a single definition of default for classifying assets and determining the PD of its obligors for risk modeling purposes. The definition of default is based on quantitative and qualitative criteria. A counterparty is classified as defaulted at the latest when material payments of interest, principal or fees are overdue for more than 90 days, or more than 180 days for certain exposures in relation to loans to private and commercial clients in Personal & Corporate Banking, and to private clients of Global Wealth Management Region Switzerland. UBS does not consider the general 90-day presumption for default recognition appropriate for those latter portfolios based on an analysis of the cure rates, which demonstrated that strict application of the 90-day criterion would not accurately reflect the inherent credit risk. Counterparties are also classified as defaulted when: bankruptcy, insolvency proceedings or enforced liquidation have commenced; obligations have been restructured on preferential terms (forbearance); or there is other evidence that payment obligations will not be fully met without recourse to collateral. The latter may be the case even if, to date, all contractual payments have been made when due. If one claim against a counterparty is defaulted on, generally all claims against the counterparty are treated as defaulted.

An instrument is classified as credit-impaired if the counterparty is classified as defaulted, and/or the instrument is identified as purchased or originated credit-impaired (POCI). An instrument is POCI if it has been purchased at a deep discount to its carrying amount following a risk event of the issuer or originated with a defaulted counterparty. Once a financial asset is classified as defaulted / credit-impaired (except POCI), it is reported as a stage 3 instrument and remains as such unless all past due amounts have been rectified, additional payments have been made on time, the position is not classified as credit-restructured, and there is general evidence of credit recovery. A three-month probation period is applied before a transfer back to stages 1 or 2 can be triggered. However, most instruments remain in stage 3 for a longer period. ▲

Exposure categorization



1 Excluding purchased or originated credit-impaired instruments. 2 May include purchased or originated credit-impaired instruments.

Forbearance (credit restructuring)

Audited | Under imminent payment default or where default has already occurred, we may grant concessions to borrowers in financial difficulties that we would otherwise not consider in the normal course of our business, such as offering preferential interest rates, extending maturity, modifying the schedule of repayments, debt / equity swap, subordination, etc. When a forbearance measure takes place, each case is considered individually and the exposure is generally classified as defaulted. Forbearance classification will remain until the loan is collected or written off, non-preferential conditions are granted that supersede the preferential conditions or until the counterparty has recovered and the preferential conditions no longer exceed our risk tolerance.

Contractual adjustments when there is no evidence of imminent payment default, or where changes to terms and conditions are within our usual risk tolerance, are not considered to be forborne. ▲

Loss history statistics

An instrument is classified as credit-impaired if the counterparty has defaulted. This also includes credit-impaired exposures for which no loss has occurred or for which no allowance has been recognized (e.g., because they are expected to be fully recoverable through the collateral held).

The "Loss history statistics" table below provides a five-year history of our credit loss experience for loans and advances to banks and customers, and ratios of those credit losses relative to our credit-impaired and non-performing loans and advances to banks and customers. For the years 2015 to 2017, the amounts are based on IAS 37 and IAS 39; for 2018 and 2019, the amounts are based on IFRS 9.

Credit-impaired loans and advances to banks and customers were USD 2.3 billion as of 31 December 2019, unchanged compared with 31 December 2018.

The majority of the credit-impaired exposure relates to loans and advances in our Swiss domestic business. The ratio of credit-impaired loans and advances to banks and customers to total loans and advances to banks and customers was 0.7%, unchanged compared with 31 December 2018.

→ **Refer "Note 10 Financial assets at amortized cost and other positions in scope of expected credit loss measurement" and "Note 23 Expected credit loss measurement" in the "Consolidated financial statements" section of this report for more information about ECL measurement**

→ **Refer to "Note 17a Other financial assets measured at amortized cost" in the "Consolidated financial statements" section of this report for more details**

Loss history statistics

USD million, except where indicated	31.12.19 IFRS 9	31.12.18 IFRS 9	31.12.17 IAS 37, IAS 39	31.12.16 IAS 37, IAS 39	31.12.15 IAS 37, IAS 39
Loans and advances to banks and customers (gross)	340,003	338,000	342,604	314,485	324,059
Credit-impaired loans and advances to banks and customers	2,309	2,300	1,104	958	1,224
Non-performing loans and advances to banks and customers	2,466	2,419	2,149	2,357	1,627
ECL allowances and provisions for credit losses[1,2]	1,029	1,054	712	642	726
of which: allowances for loans and advances to banks and customers[1]	*770*	*780*	*678*	*589*	*691*
Write-offs[3]	142	210	101	121	116
of which: write-offs for loans and advances to banks and customers	*122*	*192*	*101*	*121*	*116*
Credit loss (expense) / recovery[4]	(78)	(118)	(131)	(38)	(118)
Ratios					
Credit-impaired loans and advances to banks and customers as a percentage of loans and advances to banks and customers (gross)	0.7	0.7	0.3	0.3	0.4
Non-performing loans and advances to banks and customers as a percentage of loans and advances to banks and customers (gross)	0.7	0.7	0.6	0.7	0.5
ECL allowances for loans and advances to banks and customers as a percentage of loans and advances to banks and customers (gross)	0.2	0.2	0.2	0.2	0.2
Net write-offs as a percentage of average loans and advances to banks and customers (gross) outstanding during the period	0.0	0.1	0.0	0.0	0.0

1 Includes collective loan loss allowances (until 31 December 2017). Until 31 December 2017 did not include allowances for other receivables (31 December 2017: USD 19 million; 31 December 2016: USD 0 million; 31 December 2015: USD 0 million). 2 Includes provisions for ECL of guarantees and loan commitments and allowances for securities financing transactions. 3 Includes net write-offs for loan commitments and securities financing transactions. 4 Includes credit loss (expense) / recovery for other financial assets at amortized cost, guarantees, loan commitments, and securities financing transactions.

Market risk

Key developments

Market risk remained at low levels as a result of our continued focus on managing tail risks. Average management VaR (1-day, 95% confidence level) decreased to USD 11 million from USD 12 million in the prior year, mainly driven by the Investment Bank's Equities business. The number of negative backtesting exceptions within a 250-business-day window decreased from 2 to 0 by the end of the year. The FINMA VaR multiplier for market risk RWA remained unchanged at 3 as of 31 December 2019.

Audited | Main sources of market risk

Market risks arise from both our trading and non-trading business activities.

- Trading market risks arise mainly in connection with primary debt and equity underwriting, securities and derivatives trading for market-making and client facilitation within our Investment Bank, as well as the remaining positions within Non-core and Legacy Portfolio in Corporate Center and our municipal securities trading business within Global Wealth Management.
- Non-trading market risks arise predominantly in the form of interest rate and foreign exchange risks in connection with personal banking and lending in our wealth management businesses, our personal and corporate banking business in Switzerland and the Investment Bank's lending business, in addition to treasury activities.
- Group Treasury assumes market risks in the process of managing interest rate risk, structural foreign exchange risk and the liquidity and funding profile (including high-quality liquid assets) of the Group.
- Equity and debt investments can also give rise to market risks, as can some aspects of our employee benefits, such as defined benefit pension schemes. ▲

Audited | Overview of measurement, monitoring and management techniques

- Market risk limits are set for the Group, the business divisions, Group Treasury and Non-core and Legacy Portfolio at granular levels within the various business lines, reflecting the nature and magnitude of the market risks.
- Management VaR measures exposures under the market risk framework. This includes trading market risks and parts of non-trading market risks. Non-trading market risks not included in VaR are also covered in the risks controlled by Market & Treasury Risk Control as set out further below.
- Our primary portfolio measures of market risk are liquidity-adjusted stress (LAS) loss and VaR. Both are common to all our business divisions and subject to limits that are approved by the Board of Directors (the BoD).
- These measures are complemented by concentration and granular limits for general and specific market risk factors. Our trading businesses are subject to multiple market risk limits. These limits take into account the extent of market liquidity and volatility, available operational capacity, valuation uncertainty and, for our single-name exposures, the credit quality of issuers.
- Trading market risks are managed on an integrated basis at a portfolio level. As risk factor sensitivities change due to new transactions, transaction expiries or changes in market levels, risk factors are dynamically rehedged to remain within limits. Accordingly, in the trading portfolio, we do not generally seek to distinguish between specific positions and associated hedges.
- Issuer risk is controlled by limits applied at the business division level based on jump-to-zero measures, which estimate our maximum default exposure (the loss in the case of a default event assuming zero recovery).
- Non-trading foreign exchange risks are managed under market risk limits, with the exception of Group Treasury management of consolidated capital activity.

Our Market & Treasury Risk Control function applies a holistic risk framework, which sets the appetite for treasury-related risk-taking activities across the Group. A key element of the framework is an overarching economic value sensitivity limit, set by the BoD. This limit is linked to the level of Basel III common equity tier 1 (CET1) capital, and takes into account risks arising from interest rates, foreign exchange and credit spreads. In addition, the sensitivity of net interest income to changes in interest rates is monitored against targets set by the Group Chief Executive Officer, in order to analyze the outlook and volatility of net interest income based on market-expected interest rates. Limits are also set by the BoD to balance the effect of foreign exchange movements on our CET1 capital and CET1 capital ratio. Non-trading interest rate and foreign exchange risks are included in our Group-wide statistical and stress testing metrics, which flow into our risk appetite framework.

Equity and debt investments are subject to a range of risk controls, including preapproval of new investments by business management and Risk Control and regular monitoring and reporting. They are also included in our Group-wide statistical and stress testing metrics, which flow into our risk appetite framework. ▲

→ **Refer to "Currency management" in the "Treasury management" section of this report for more information about Group Treasury's management of foreign exchange risks**

→ **Refer to the "Capital management" section of this report for more information about the sensitivity of our CET1 capital and CET1 capital ratio to currency movements**

Market risk stress loss

In addition to VaR, which is discussed below, we measure and manage our market risks through a comprehensive framework of non-statistical measures and related limits. This includes an extensive series of stress tests and scenario analyses, which we continuously evaluate with the intention of ensuring that any losses resulting from an extreme yet plausible event do not exceed our risk appetite.

Liquidity-adjusted stress

Our primary measure of stress loss for Group-wide market risk is LAS. The LAS framework is designed to capture the economic losses that could arise under specified stress scenarios. This is in part achieved by replacing the standard one-day and 10-day holding period assumptions used for management and regulatory VaR, with liquidity-adjusted holding periods, as explained below. Shocks are then applied to positions based on the expected market movements over the liquidity-adjusted holding periods resulting from the specified scenario.

The holding periods used in LAS are calibrated to reflect the amount of time it would take to reduce or hedge the risk of positions in each major risk factor in a stressed environment, assuming maximum utilization of the relevant position limits. We also apply minimum holding periods, regardless of observed liquidity levels, reflecting the fact that identification of and reaction to a crisis may not always be immediate.

The expected market movements are derived using a combination of historical market behavior, based on an analysis of historical events, and forward-looking analysis that includes consideration of defined scenarios that have not occurred historically.

LAS-based limits are applied at a number of levels: Group, business division, Group Treasury and Non-core and Legacy Portfolio; business area; and sub-portfolio. In addition, LAS forms the core market risk component of our combined stress test framework and is therefore integral to our overall risk appetite framework.

→ **Refer to "Risk appetite framework" in this section for more information**

→ **Refer to "Stress testing" in this section for more information about our stress testing framework**

Value-at-risk

VaR definition

Audited | VaR is a statistical measure of market risk, representing the market risk losses that could potentially be realized over a set time horizon (holding period) at an established level of confidence. The measure assumes no change in the Group's trading positions over the set time horizon.

We calculate VaR on a daily basis. The profit or loss distribution from which VaR is derived is generated by our internally developed VaR model. The VaR model simulates returns over the holding period of those risk factors to which our trading positions are sensitive, and subsequently quantifies the profit or loss effect of these risk factor returns on the trading positions. Risk factor returns associated with the risk factor classes of general interest rates, foreign exchange and commodities are based on a pure historical simulation approach, taking into account a five-year look-back window. Risk factor returns for selected issuer-based risk factors, such as equity price and credit spreads, are decomposed into systematic and residual, issuer-specific components using a factor model approach. Systematic returns are based on historical simulation, and residual returns are based on a Monte Carlo simulation. The VaR model profit or loss distribution is derived from the sum of the systematic and residual returns in such a way that we consistently capture systematic and residual risk. Correlations among risk factors are implicitly captured via the historical simulation approach. In modeling the risk factor returns, we consider the stationarity properties of the historical time series of risk factor changes. Depending on the stationarity properties of the risk factors within a given risk factor class, we choose to model the risk factor returns using absolute returns or logarithmic returns. The risk factor return distributions are updated on a fortnightly basis.

Although our VaR model does not have full revaluation capability, we source full revaluation grids and sensitivities from our front-office systems, enabling us to capture material non-linear profit or loss effects.

We use a single VaR model for both internal management purposes and determining market risk risk-weighted assets (RWA), although we consider different confidence levels and time horizons. For internal management purposes, we establish risk limits and measure exposures using VaR at the 95% confidence level with a one-day holding period, aligned to the way we consider the risks associated with our trading activities. The regulatory measure of market risk used to underpin the market risk capital requirement under Basel III requires a measure equivalent to a 99% confidence level using a 10-day holding period. In the calculation of a 10-day holding period VaR, we employ 10-day risk factor returns, whereby all observations are equally weighted.

Additionally, the population of the portfolio within management and regulatory VaR is slightly different. The population within regulatory VaR meets regulatory requirements for inclusion in regulatory VaR. Management VaR includes a broader population of positions. For example, regulatory VaR excludes the credit spread risks from the securitization portfolio, which are treated instead under the securitization approach for regulatory purposes.

We also use stressed VaR (SVaR) for the calculation of market risk RWA. SVaR adopts broadly the same methodology as regulatory VaR and is calculated using the same population, holding period (10-day) and confidence level (99%). However, unlike regulatory VaR, the historical data set for SVaR is not limited to five years, but instead spans the time period from 1 January 2007 to the present. In deriving SVaR, we search for the largest 10-day holding period VaR for the current Group portfolio across all one-year look-back windows that fall into the interval from 1 January 2007 to the present. SVaR is computed weekly. ▲

→ **Refer to the 31 December 2019 Pillar 3 report, available under "Pillar 3 disclosures" at *www.ubs.com/investors*, for more information about the regulatory capital calculation under the advanced internal ratings-based approach**

Management VaR for the period

The tables below show minimum, maximum, average and period-end management VaR by business division and Corporate Center, and by general market risk type. We continued to manage management VaR at low levels with average VaR decreasing to USD 11 million from USD 12 million in the prior year.

Audited I

Management value-at-risk (1-day, 95% confidence, 5 years of historical data) of our business divisions and Corporate Center by general market risk type[1]

	For the year ended 31.12.19								
USD million					Equity	Interest rates	Credit spreads	Foreign exchange	Commodities
	Min.				2	6	3	2	1
		Max.			14	12	8	8	6
			Average		6	9	5	3	2
				31.12.19	5	8	5	3	3
Total management VaR, Group	6	18	11	9	*Average (per business division and risk type)*				
Global Wealth Management	0	1	1	1	*0*	*1*	*1*	*0*	*0*
Personal & Corporate Banking	0	0	0	0	*0*	*0*	*0*	*0*	*0*
Asset Management	0	0	0	0	*0*	*0*	*0*	*0*	*0*
Investment Bank	4	17	9	7	*6*	*7*	*4*	*3*	*2*
Corporate Center	4	8	5	5	*1*	*5*	*2*	*1*	*0*
Diversification effect[2,3]			(5)	(4)	*(1)*	*(4)*	*(2)*	*(1)*	*0*

	For the year ended 31.12.18								
USD million					Equity	Interest rates	Credit spreads	Foreign exchange	Commodities
	Min.				3	5	5	1	1
		Max.			22	11	9	13	4
			Average		8	8	7	3	2
				31.12.18	5	7	5	6	2
Total management VaR, Group	5	26	12	12	*Average (per business division and risk type)*				
Global Wealth Management	0	2	1	1	*0*	*1*	*2*	*0*	*0*
Personal & Corporate Banking	0	0	0	0	*0*	*0*	*0*	*0*	*0*
Asset Management	0	0	0	0	*0*	*0*	*0*	*0*	*0*
Investment Bank	4	25	11	10	*8*	*6*	*6*	*3*	*2*
Corporate Center	4	7	5	6	*1*	*4*	*2*	*1*	*0*
Diversification effect[2,3]			(5)	(5)	*(1)*	*(4)*	*(3)*	*(1)*	*0*

1 Statistics at individual levels may not be summed to deduce the corresponding aggregate figures. The minima and maxima for each level may well occur on different days, and likewise, the VaR for each business line or risk type, being driven by the extreme loss tail of the corresponding distribution of simulated profits and losses for that business line or risk type, may well be driven by different days in the historical time series, rendering invalid the simple summation of figures to arrive at the aggregate total. 2 Difference between the sum of the standalone VaR for the business divisions and Corporate Center and the VaR for the Group as a whole. 3 As the minimum and maximum occur on different days for different business divisions and Corporate Center, it is not meaningful to calculate a portfolio diversification effect.

▲

VaR limitations

Audited | Actual realized market risk losses may differ from those implied by our VaR for a variety of reasons.

- The VaR measure is calibrated to a specified level of confidence and may not indicate potential losses beyond this confidence level.
- The one-day time horizon used for VaR for internal management purposes, or 10-day in the case of the regulatory VaR measure, may not fully capture the market risk of positions that cannot be closed out or hedged within the specified period.
- In certain cases, VaR calculations approximate the effect of changes in risk factors on the values of positions and portfolios. This may happen because the number of risk factors included in the VaR model is necessarily limited.
- The effect of extreme market movements is subject to estimation errors, which may result from non-linear risk sensitivities, as well as the potential for actual volatility and correlation levels to differ from assumptions implicit in the VaR calculations.
- The use of a five-year window means that sudden increases in market volatility will tend not to increase VaR as quickly as the use of shorter historical observation periods, but the increase will affect our VaR for a longer period of time. Similarly, following a period of increased volatility, as markets stabilize, VaR predictions will remain more conservative for a period of time influenced by the length of the historical observation period.

SVaR is subject to the same limitations as noted for VaR above, but the use of one-year data sets avoids the smoothing effect of the five-year data set used for VaR, and the absence of the five-year window provides a longer history of potential loss events. Therefore, although the significant period of stress during the financial crisis of 2007–2009 is no longer contained in the historical five-year period used for management and regulatory VaR, SVaR will continue to use this data. This approach is intended to reduce the procyclicality of the regulatory capital requirements for market risks.

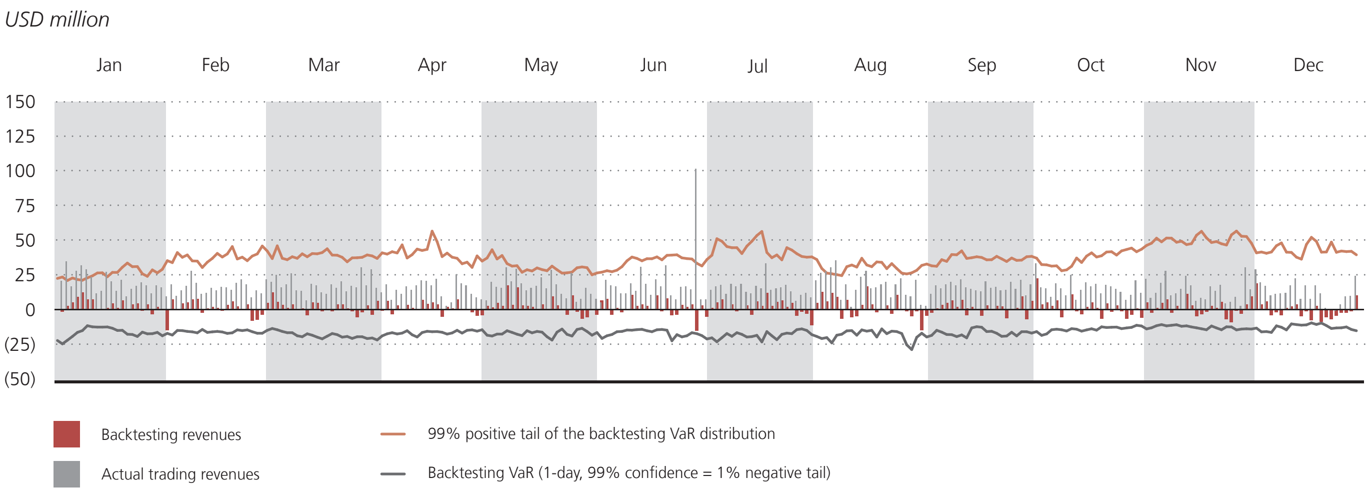
We recognize that no single measure may encompass the entirety of risks associated with a position or portfolio. Consequently, we employ a suite of various metrics with both overlapping and complementary characteristics in order to create a holistic framework that seeks to ensure material completeness of risk identification and measurement. As a statistical aggregate risk measure, VaR supplements our liquidity-adjusted stress and comprehensive stress testing frameworks.

We also have a framework to identify and quantify potential risks that are not fully captured by our VaR model. We refer to these risks as risks-not-in-VaR. This framework is used to underpin these potential risks with regulatory capital, calculated as a multiple of regulatory VaR and stressed VaR. ▲

Backtesting of VaR

VaR backtesting is a performance measurement process in which the 1-day VaR prediction is compared with the realized 1-day profit or loss (P&L). We compute backtesting VaR using a 99% confidence level and one-day holding period for the population included within regulatory VaR. Since 99% VaR at UBS is defined as a risk measure that operates on the lower tail of the P&L distribution, 99% backtesting VaR is a negative number. Backtesting revenues exclude non-trading revenues, such as valuation reserves, fees and commissions and revenues from intraday trading, to provide for a like-for-like comparison. A backtesting exception occurs when backtesting revenues are lower than the previous day's backtesting VaR.

Group: development of regulatory backtesting revenues[1] and actual trading revenues[2] against backtesting VaR[3] (1-day, 99% confidence)



1 Excludes non-trading revenues, such as valuation reserves, commissions and fees, and revenues from intraday trading. 2 Includes backtesting revenues and revenues from intraday trading. 3 Based on Basel III regulatory VaR, excludes CVA positions and their eligible hedges that are subject to the standalone CVA charge.

Statistically, given the confidence level of 99%, two or three backtesting exceptions per year can be expected. More than four exceptions could indicate that the VaR model is not performing appropriately, as could too few exceptions over a prolonged period of time. However, as noted in the VaR limitations above, a sudden increase or decrease in market volatility relative to the five-year window could lead to a higher or lower number of exceptions, respectively. Accordingly, Group-level backtesting exceptions are investigated, as are exceptional positive backtesting revenues, with results being reported to senior business management, the Group Chief Risk Officer and the Group Chief Market & Treasury Risk Officer. Backtesting exceptions are also reported to internal and external auditors and to the relevant regulators.

The "Group: development of regulatory backtesting revenues and actual trading revenues against backtesting VaR" chart on the previous page shows the 12-month development of backtesting VaR against the Group's backtesting revenues and actual trading revenues for 2019. The chart shows both the 99% and the 1% backtesting VaR. The asymmetry between the negative and positive tails is due to the long gamma risk profile that has been run historically in the Investment Bank.

The actual trading revenues include, in addition to backtesting revenues, intraday revenues.

The number of negative backtesting exceptions within a 250-business-day window decreased from 2 to 0 by the end of the year. The FINMA VaR multiplier for market risk RWA remained unchanged at 3 as of 31 December 2019.

VaR model confirmation

In addition to backtesting performed for regulatory purposes as described above, we also conduct extended backtesting for our internal model confirmation purposes. This includes observing model performance across the entire P&L distribution, not just the tails, and at multiple levels within the business division and Corporate Center hierarchies.

→ **Refer to "Risk measurement" in this section for more information about our approach to model confirmation procedures**

VaR model developments in 2019

Audited | We did not make any material changes to the VaR model in 2019. ▲

Future market risk-related regulatory capital developments

In January 2019, the Basel Committee on Banking Supervision published the final rules on the minimum capital requirements for market risk (the Fundamental Review of the Trading Book). As per the Swiss timelines for adopting Basel III, the new accord is expected to enter into force on 1 January 2023 at the earliest.

Key elements of the revised market risk framework include: (i) changes to the internal model-based approach, including changes to the model approval and performance measurement process; (ii) changes to the standardized approach with the aim of it being a credible fallback method for an internal model-based approach; and (iii) a revised boundary between trading book and banking book. UBS maintains a close dialog with FINMA to discuss the implementation objectives in more detail and to provide a smooth transition of the capital regime for market risk.

→ **Refer to "Capital management objectives, planning and activities" in the "Capital management" section of this report for more information about the development of RWA**

→ **Refer to "Risk measurement" in this section for more information about our approach to model confirmation procedures**

→ **Refer to the "Regulatory and legal developments" and "Risk factors" sections of this report for more information**

Interest rate risk in the banking book

Changes to our interest rate risk in the banking book disclosure

Based on the 2016 standards of the Basel Committee on Banking Supervision, FINMA published the revised Circular "2019/2 Interest Rate Risk – Banks," which sets out minimum standards for the measurement, management, monitoring and control of interest rate risks in the banking book (IRRBB). This circular came into effect in January 2019, with the first enhanced Pillar 3 disclosure provided in our 30 June 2019 Pillar 3 report.

We have aligned the IRRBB disclosure in our financial reports to the new Pillar 3 requirements. In particular, the economic value of equity (EVE) sensitivity is assessed under six regulatory rate-shock scenarios defined by FINMA in the circular, which are currency-specific and not subject to flooring.

Sources of interest rate risk in the banking book

Audited | IRRBB arises from balance sheet positions such as *Loans and advances to banks*, *Loans and advances to customers*, *Financial assets at fair value not held for trading*, *Financial assets measured at amortized cost*, *Customer deposits*, *Debt issued measured at amortized cost*, and derivatives, including those used for cash flow hedge accounting purposes. These positions may affect other comprehensive income (OCI) or the income statement, depending on their accounting treatment.

Our largest banking book interest rate exposures arise from customer deposits and lending products in Global Wealth Management and Personal & Corporate Banking. The inherent interest rate risks are generally transferred from Global Wealth Management and Personal & Corporate Banking to Group Treasury, to manage them centrally within Corporate Center. This allows for the netting of interest rate risks across different sources, while leaving the originating businesses with commercial margin and volume management. The residual interest rate risk is mainly hedged with interest rate swaps, to the vast majority of which we apply hedge accounting. Short-term exposures and high-quality liquid assets classified as *Financial assets at fair value not held for trading* are hedged with derivatives accounted for on a mark-to-market basis. Long-term fixed-rate debt issued is hedged with interest rate swaps designated in fair value hedge accounting relationships.

Risk management and governance

IRRBB is measured using a number of metrics, the most relevant of which are the following:

– Interest rate sensitivities to parallel shifts in yield curves, calculated as changes in the present value of future cash flows irrespective of accounting treatment. These are also the key risk factors for statistical and stress-based measures, such as value-at-risk and stress scenarios (including EVE sensitivity), and are measured and reported with a daily frequency. EVE sensitivity is the exposure arising from the most adverse regulatory interest rate scenario after netting across currencies. In addition to the regulatory measure, we apply an internal EVE sensitivity metric that includes equity, goodwill, real estate and additional tier 1 (AT1) capital instruments.
– Net interest income (NII) sensitivity assesses the change in NII over a set time horizon compared with the baseline NII, which we internally calculate by assuming that interest rates in all currencies develop according to their market-implied forward rates and under the assumption of constant business volumes and no specific management actions. The internal NII sensitivity, which includes the contribution from cash held at central banks, unlike the Pillar 3 disclosure requirements, is measured and reported on a monthly basis.

We actively manage IRRBB, with the objective of reducing the volatility of NII, while keeping the EVE sensitivity within set internal risk limits.

EVE and NII sensitivity are monitored against limits and triggers, both at consolidated and at significant legal entity levels. We also assess the sensitivity of EVE and NII under stressed market conditions by applying a suite of parallel and non-parallel interest rate scenarios, as well as specific economic scenarios.

The Interest Rate Risk in the Banking Book Strategy Committee, which is a sub-committee of the Group Asset and Liability Committee (ALCO), and, where relevant, ALCOs at a legal entity level, perform independent oversight over the management of IRRBB. IRRBB is also subject to Group Internal Audit and model governance.

→ **Refer to "Group Internal Audit" in the "Corporate governance" section of this report and to "Risk measurement" in this section for more information**

Key modeling assumptions

The cash flows from customer deposits and lending products used in the calculation of EVE sensitivity exclude commercial margins and other spread components, are aggregated for each business day and are discounted using risk-free rates. Our external issuances are discounted using UBS's senior debt curve, and capital instruments are modeled to the first call date. NII sensitivity is calculated over a one-year time horizon, assuming constant balance sheet structure and volumes, and considers the flooring effect of embedded interest rate options.

The average repricing maturity of non-maturing deposits and loans is determined via replication portfolio strategies that are designed to protect product margin. Optimal replicating portfolios are determined at a granular currency- and product-specific level by simulating and applying a real-world market rate model to historically calibrated client rate and volume models.

We use an econometric prepayment model to forecast prepayment rates on US mortgage loans in UBS Bank USA, as well as agency mortgage-backed securities (MBSs) held in various liquidity portfolios of UBS Americas Holding LLC consolidated. These prepayment rates are used to forecast both mortgage loan and MBS balances under various macroeconomic scenarios. The prepayment model is used for a variety of purposes, including risk management and regulatory stress testing. Mortgages in Switzerland and fixed-term deposits generally do not carry similar optionality, due to prepayment and early redemption penalties. ▲

Effect of interest rate changes on shareholders' equity and CET1 capital

The "Accounting and capital effect of changes in interest rates" table below illustrates the effects on shareholders' equity and CET1 capital of gains and losses resulting from changes in interest rates in the main banking book positions. For instruments held at fair value, a change in interest rates results in an immediate fair value gain or loss recognized either in the income statement or through OCI. Typically, increases in interest rates would lead to an immediate reduction in the value of our long-term assets held at fair value, but we would expect such reduction to be offset over time through higher NII on our core banking products.

For assets and liabilities measured at amortized cost, a change in interest rates does not result in a change in the carrying amount of the instruments, but could affect the amount of interest income or expense recognized over time in the income statement.

In addition to the differing accounting treatments, our banking book positions have different sensitivities to different points on yield curves. For example, our portfolios of debt securities, whether measured at amortized cost or at fair value, and interest rate swaps, whether designated as cash flow hedges or transacted as economic hedges, are, on the whole, more sensitive to changes in longer-duration interest rates, whereas our deposits and a significant portion of our loans contributing to NII are more sensitive to short-term rates. These factors are important, as yield curves may not shift on a parallel basis and could, for example, exhibit an initial steepening, followed by a flattening over time.

By virtue of the accounting treatment and yield curve sensitivities outlined above, in a rising rate scenario, we would expect to recognize an initial decrease in shareholders' equity as a result of fair value losses recognized in OCI. This would be compensated over time by increased NII as increases in interest rates affect the shorter end of the yield curve in particular. The effect on CET1 capital would be less pronounced, as gains and losses on interest rate swaps designated as cash flow hedges are not recognized for regulatory capital purposes. Fair value losses on instruments designated at fair value are expected to be offset by economic hedges.

Accounting and capital effect of changes in interest rates[1]

	Recognition		Shareholders' equity		CET1 capital	
	Timing	Income statement / OCI	Gains	Losses	Gains	Losses
Loans and deposits at amortized cost[2,3]	Gradual	Income statement	●	●	●	●
Other financial assets and liabilities measured at amortized cost[2]	Gradual	Income statement	●	●	●	●
Debt issued measured at amortized cost[2,3]	Gradual	Income statement	●	●	●	●
Receivables and payables from securities financing transactions[2]	Gradual	Income statement	●	●	●	●
Financial assets at fair value not held for trading	Immediate	Income statement	●	●	●	●
Financial assets at fair value through other comprehensive income	Immediate	OCI	●	●		●
Derivatives designated as cash flow hedges	Immediate	OCI[4]	●	●		
Derivatives transacted as economic hedges	Immediate	Income statement	●	●	●	●

1 Refer to the "Reconciliation of IFRS equity to Swiss SRB common equity tier 1 capital" table in the "Capital management" section of this report for more information on the differences between shareholders' equity and CET1 capital. 2 For fixed-rate financial instruments, changes in interest rates affect the income statement when these instruments roll over and reprice. 3 For hedge accounted items, a fair value adjustment is applied in line with the treatment of the hedging derivatives. 4 Excluding hedge ineffectiveness that is recognized in the income statement in accordance with IFRS.

Net interest income sensitivity

At the end of 2019, the net interest income sensitivity of Global Wealth Management and Personal & Corporate Banking was assessed under the following scenarios:

- Negative Interest Rates: Yield curves drop 100 basis points in parallel with no zero-floor applied and therefore can become negative, or more negative.
- Rates Bull Flattener: Yield curves across all currencies undergo a sharp decrease for long tenors, with a lower decrease at the short end of the curve: –70 basis points for tenors up to 3 months, –100 basis points for the 3-year tenor and –130 basis points for +10-year tenors.
- Rates Bull Steepener: Yield curves across all currencies undergo a sharp decrease for short tenors, with a lower decrease at the long end of the curve: –130 basis points for tenors up to 3 months, –100 basis points for the 3-year tenor and –70 basis points for +10-year tenors.
- Rates Bear Steepener: Yield curves across all currencies undergo a sharp increase for long tenors, with a lower increase at the short end of the curve: +70 basis points for tenors up to 3 months, +100 basis points for the 3-year tenor and +130 basis points for +10-year tenors.
- Rates Bear Flattener: Yield curves across all currencies undergo a sharp increase for short tenors, with a lower increase at the long end of the curve: +130 basis points for tenors up to 3 months, +100 basis points for the 3-year tenor and +70 basis points for +10-year tenors.
- Parallel +100 basis points: All yield curves rise 100 basis points in parallel.
- Constant Rates: All rates stay at current levels.

With the exception of the Constant Rates scenario, immediately after the shock, interest rates evolve according to market-implied forward rates of that scenario.

The results are compared with a baseline NII, which is calculated assuming that interest rates in all currencies develop according to their market-implied forward rates and under the assumption of constant business volumes and no specific management actions. Over a one-year horizon, the most adverse scenario is the Rates Bull Steepener, resulting in a deterioration in Baseline NII of approximately 9%, while the most beneficial scenario is the Rates Bear Flattener, which would lead to an improvement in Baseline NII of approximately 10%. In addition to the above scenario analysis, we also monitor the sensitivity of NII to immediate parallel shocks of –200 and +200 basis points against the defined thresholds, under the assumption of a constant balance sheet volume and structure.

As of 31 December 2019, the baseline NII would have been approximately 16% lower under a parallel shock of –200 basis points, whereas under a parallel +200-basis-point shock, the baseline NII would have been approximately 23% higher.

To shelter the level of our NII from the persistently low and negative interest rate environment in Swiss francs in particular, we rely on the self-funding of our lending businesses through our deposit base in Global Wealth Management and Personal & Corporate Banking, along with appropriate additional adjustments to our interest rate-linked product pricing. The loss of such equilibrium on the balance sheet, for example, due to unattractive pricing relative to our peers for either our mortgages or deposits, could lead to a decrease in our NII in a persistently low and negative interest rate environment. As we assume constant business volumes, these risks do not appear in the aforementioned interest rate scenarios.

Moreover, should the low and negative interest rate environment persist or worsen, this could lead to additional pressure on our NII and we could face additional costs for holding our Swiss franc high-quality liquid asset portfolio. A reduction of the Swiss National Bank's deposit exemption threshold for banks would also reduce our NII as we might not be able to offset the higher costs for our cash holdings, for example, by passing on some of the costs to our depositors. Should euro interest rates also decline significantly further into negative territory, this could likewise increase our liquidity costs and put our NII generated from euro-denominated loans and deposits under pressure. Depending on the overall economic and market environment, sustained and significant negative rates could also lead to our Global Wealth Management and Personal & Corporate Banking clients paying down their loans together with reducing any excess cash they hold with us as deposits. This would reduce the underlying business volume and lower our NII accordingly.

The NII impact of a net decrease in deposits would depend on various factors including the currency, its interest rate level, as well as the balance sheet situation, as this could be offset by a reduction in negative-yielding liquidity portfolios or require alternative funding. In the latter case, the cost would also significantly depend on the term and nature of the replacement funding, whether such funding is raised in the wholesale markets or from swapping with available funding denominated in another currency. On the other hand, imbalances leading to an excess deposit position could require additional investments at negative yields, which we might not be able to compensate for sufficiently through our excess deposit balance charging mechanisms.

Economic value sensitivity

Audited |. Interest rate risk in the banking book is subject to a regulatory threshold of 15% of tier 1 capital to identify outlier banks. The exposure is calculated as the theoretical change in the present value of the banking book under the most adverse of the six FINMA interest rate scenarios.

As of 31 December 2019, the interest rate sensitivity of our banking book to a +1-basis-point parallel shift in yield curves was negative USD 25.1 million. The reported interest rate sensitivity excludes the AT1 capital instruments, as per FINMA Pillar 3 disclosure requirements, and our equity, goodwill and real estate with a modeled sensitivity of approximately USD 4 million per basis point in Swiss francs and USD 15 million per basis point in US dollars.

The most adverse of the six FINMA interest rate scenarios with regard to EVE was the "Parallel up" scenario, resulting in a change of the economic value of equity of negative USD 5.0 billion, representing a pro forma reduction of 9.6% of tier 1 capital, which is well below the regulatory outlier test of 15% of tier 1 capital. The immediate effect of the "Parallel up" scenario on tier 1 capital as of 31 December 2019 would be a reduction of 1.3%, or USD 0.7 billion, arising from the part of our banking book that is measured at fair value through profit or loss and from the financial assets measured at fair value through other comprehensive income. This scenario would, however, have had a positive effect on net interest income. ▲

→ **Refer to "Note 14 Financial assets measured at fair value through other comprehensive income" in the "Consolidated financial statements" section of this report for more information**

→ **Refer to the "Group performance" section of this report for more information about sensitivity to interest rate movements**

Audited |

Interest rate risk – banking book

USD million	+1 bp	Parallel up[1]	Parallel down[1]	Steepener[2]	Flattener[3]	Short-term up[4]	Short-term down[5]
CHF	(3.3)	(463.1)	519.6	(235.7)	143.9	(44.7)	47.6
EUR	(0.4)	(73.6)	79.3	(5.3)	(7.3)	(28.0)	29.5
GBP	0.1	8.9	(23.0)	(6.7)	6.4	11.5	(11.0)
USD	(20.8)	(4,317.5)	3,570.0	(566.9)	(450.5)	(2,019.7)	2,132.4
Other	(0.8)	(157.9)	169.9	(1.4)	(29.8)	(85.0)	93.5
Total effect on economic value of equity as per Pillar 3 requirement as of 31.12.19	(25.1)	(5,003.2)	4,315.9	(816.1)	(337.2)	(2,166.0)	2,292.0
Additional tier 1 (AT1) capital instruments	5.0	954.3	(1,024.6)	(42.2)	253.5	610.8	(638.5)
Total including AT1 capital instruments as of 31.12.19	(20.1)	(4,048.9)	3,291.2	(858.3)	(83.7)	(1,555.2)	1,653.5

1 Rates across all tenors move by ±150 bps for Swiss franc, ±200 bps for euro and US dollar and ±250 bps for pound sterling. 2 Short-term rates decrease and long-term rates increase. 3 Short-term rates increase and long-term rates decrease. 4 Short-term rates increase more than long-term rates. 5 Short-term rates decrease more than long-term rates.

Other market risk exposures

Own credit

We are exposed to changes in UBS's own credit that are reflected in the valuation of financial liabilities designated at fair value when UBS's own credit risk would be considered by market participants. We also estimate debit valuation adjustments (DVA) to incorporate own credit in the valuation of derivatives.

→ **Refer to "Note 24 Fair value measurement" in the "Consolidated financial statements" section of this report for more information about own credit**

Structural foreign exchange risk

Upon consolidation, assets and liabilities held in foreign operations are translated into US dollars at the closing foreign exchange rate on the balance sheet date. Value changes (in US dollars) of non-US dollar assets or liabilities due to foreign exchange movements are recognized in OCI and therefore affect shareholders' equity and CET1 capital.

Group Treasury employs strategies to manage this foreign currency exposure, including matched funding of assets and liabilities and net investment hedging.

→ **Refer to the "Treasury management" section of this report for more information about our exposure to and management of structural foreign exchange risk**

→ **Refer to "Note 11 Derivative instruments" in the "Consolidated financial statements" section of this report for more information about our hedges of net investments in foreign operations**

Equity investments

Audited | Under International Financial Reporting Standards (IFRS) effective on 31 December 2019, equity investments not in the trading book may be classified as *Financial assets at fair value not held for trading* or *Investments in associates*.

We make direct investments in a variety of entities and buy equity holdings in both listed and unlisted companies for a variety of purposes. This includes investments such as exchange and clearing house memberships held to support our business activities. We may also make investments in funds that we manage in order to fund or seed them at inception or to demonstrate that our interests align with those of investors. We also buy, and are sometimes required by agreement to buy, securities and units from funds that we have sold to clients.

The fair value of equity investments tends to be influenced by factors specific to the individual investments. Equity investments are generally intended to be held for the medium or long term and may be subject to lock-up agreements. For these reasons, we generally do not control these exposures by using the market risk measures applied to trading activities. However, such equity investments are subject to a different range of controls, including preapproval of new investments by business management and Risk Control, portfolio and concentration limits, and regular monitoring and reporting to senior management. They are also included in our Group-wide statistical and stress testing metrics, which flow into our risk appetite framework.

As of 31 December 2019, we held equity investments totaling USD 2.4 billion, of which USD 1.3 billion was classified as *Financial assets at fair value not held for trading* and USD 1.1 billion as *Investments in associates*. This was broadly unchanged from the prior year. ▲

→ **Refer to "Note 24 Fair value measurement" and "Note 31 Interests in subsidiaries and other entities" in the "Consolidated financial statements" section of this report for more information**

→ **Refer to "Note 1 Summary of significant accounting policies" in the "Consolidated financial statements" section of this report for more information about the classification of financial instruments**

Debt investments

Audited | Debt investments classified as *Financial assets measured at fair value through OCI* as of 31 December 2019 were measured at fair value with changes in fair value recorded through *Equity*, and can broadly be categorized as money market instruments and debt securities primarily held for statutory, regulatory or liquidity reasons.

The risk control framework applied to debt instruments classified as *Financial assets measured at fair value through OCI* depends on the nature of the instruments and the purpose for which we hold them. Our exposures may be included in market risk limits or be subject to specific monitoring and interest rate sensitivity analysis. They are also included in our Group-wide statistical and stress testing metrics, which flow into our risk appetite framework.

Debt instruments classified as *Financial assets measured at fair value through OCI* had a fair value of USD 6.3 billion as of 31 December 2019 compared with USD 6.7 billion as of 31 December 2018. ▲

→ **Refer to "Note 24 Fair value measurement" in the "Consolidated financial statements" section of this report for more information**

→ **Refer to "Economic value sensitivity" in this section for more information**

→ **Refer to "Note 1 Summary of significant accounting policies" in the "Consolidated financial statements" section of this report for more information about the classification of financial instruments**

Pension risk

We provide a number of pension plans for past and current employees, some of which are classified as defined benefit pension plans under IFRS. These defined benefit plans can have a material effect on our IFRS equity and CET1 capital.

In order to meet the expected future benefit payments, the plans invest employee and employer contributions in various asset classes. The funded status of the plan is the difference between the fair value of these assets and the present value of the expected future benefit payments to plan members, i.e., the defined benefit obligation.

Pension risk is the risk that the funded status of defined benefit plans might decrease, negatively affecting our IFRS equity and/or our CET1 capital. This can arise from a fall in the value of a plan's assets or in the investment returns, an increase in defined benefit obligations, or a combination of the above.

Important risk factors affecting the fair value of the plan assets are, among other things, equity market returns, interest rates, bond yields and real estate prices. Important risk factors affecting the present value of the expected future benefit payments include high-grade bond yields, interest rates, inflation rates and life expectancy.

Pension risk is included in our Group-wide statistical and stress testing metrics, which flow into our risk appetite framework. The potential effects are thus captured in the calculation of our post-stress CET1 capital ratio.

→ **Refer to "Note 1 Summary of significant accounting policies" and "Note 29 Pension and other post-employment benefit plans" in the "Consolidated financial statements" section of this report for more information about defined benefit plans**

UBS own share exposure

Group Treasury holds UBS Group AG shares to hedge future share delivery obligations related to employee share-based compensation and participation plans. In addition, the Investment Bank holds a limited number of UBS Group AG shares, primarily in its capacity as a market-maker with regard to UBS Group AG shares and related derivatives and to hedge certain issued structured debt instruments.

We began a share repurchase program in March 2018. We may repurchase up to an aggregate of CHF 2 billion of UBS Group AG shares until March 2021 under the repurchase program in accordance with Swiss regulations. During 2019, we have acquired shares for an aggregate consideration of CHF 800 million (USD 806 million). The total consideration for shares repurchased in 2018 and 2019 amounted to CHF 1,550 million (USD 1,567 million). Consistent with our capital returns policy, we intend to establish an additional share repurchase program when we have completed the current program. Shares acquired through the share repurchase program are purchased for the purpose of capital reduction. Until the shareholders of UBS Group AG approve cancelation of such shares, shares acquired in the repurchase program will be held in Group Treasury.

→ **Refer to "UBS shares" in the "Capital management" section of this report for more information**

Country risk

Country risk framework

Country risk includes all country-specific events that occur within a sovereign jurisdiction and may lead to an impairment of UBS's exposures. Country risk may take the form of: sovereign risk, which refers to the ability and willingness of a government to honor its financial commitments; transfer risk, which would arise if an issuer or counterparty could not acquire foreign currencies following a moratorium of a central bank on foreign exchange transfers; or "other" country risk. "Other" country risk may manifest itself through increased and multiple counterparty and issuer default risk (systemic risk), on the one hand, and, on the other hand, through events that may affect the standing of a country, such as adverse shocks affecting political stability or the institutional and legal framework. We maintain a well-established risk control framework, through which we assess the risk profile of all countries where we have exposure.

We attribute a sovereign rating to each foreign country, which expresses the probability of the sovereign defaulting on its own financial obligations in foreign currency. Our ratings are expressed by statistically derived default probabilities as described under "Probability of default" in this section. Based on this internal analysis, we also define the probability of a transfer event occurring, and we establish rules as to how the aspects of "other" country risk should be incorporated into the analysis of the counterparty rating of entities that are domiciled in the respective country.

Our risk exposure to foreign countries considers the credit ratings assigned to those countries. A country risk ceiling (i.e., maximum aggregate exposure) applies to our exposures to counterparties or issuers of securities and financial investments in the respective foreign country. We may limit the extension of credit, transactions in traded products or positions in securities based on a country risk ceiling, even if our exposure to a counterparty is otherwise acceptable.

For internal measurement and control of country risk, we also consider the financial effect of market disruptions arising prior to, during and after a country crisis. These may take the form of a severe deterioration in a country's debt, equity or other asset markets, or a sharp depreciation of the currency. We use stress testing to assess the potential financial effect of a severe country or sovereign crisis. This involves the developing of plausible stress scenarios for combined stress testing and the identification of countries that may potentially be subject to a crisis event, determining potential losses and making assumptions about recovery rates depending on the types of credit transactions involved and their economic importance to the affected countries.

Our exposures to market risks are also subject to regular stress tests that cover major global scenarios, which are also used for combined stress testing, whereby we apply market shock factors to equity indices, interest rates and currency rates in all relevant countries and consider the potential liquidity of the instruments.

Country risk exposure

Country risk exposure measure

The presentation of country risk follows our internal risk view, whereby the basis for measurement of exposures depends on the product category into which we have classified our exposures. In addition to the classification of exposures into banking products and traded products, as defined in "Credit risk profile of the Group" in this section, within trading inventory we classify issuer risk on securities such as bonds and equities, as well as the risk relating to the underlying reference assets for derivative positions. This includes those linked to credit protection that we buy or sell, loan or security underwriting commitments pending distribution and single-stock margin loans for syndication.

As we manage the trading inventory on a net basis, we net the value of long positions against short positions with the same underlying issuer. Net exposures are, however, floored at zero per issuer in the figures presented in the following tables. As a result, we do not recognize the potentially offsetting benefit of certain hedges and short positions across issuers.

We do not recognize any expected recovery values when reporting country exposures as exposure before hedges, except for the risk-reducing effects of master netting agreements and collateral held in the form of either cash or portfolios of diversified marketable securities, which we deduct from the basic positive exposure values. Within banking products and traded products, the risk-reducing effect of any credit protection is taken into account on a notional basis when determining the net of hedge exposures.

Country risk exposure allocation

In general, exposures are shown against the country of domicile of the contractual counterparty or the issuer of the security. For some counterparties whose economic substance in terms of assets or source of revenues is primarily located in a different country, the exposure is allocated to the risk domicile of that issuer.

This is the case with, for example, legal entities incorporated in financial offshore centers, which have their main assets and revenue streams outside the country of domicile. The same principle applies to exposures for which we hold third-party guarantees or collateral, where we report the exposure against the country of domicile of either the guarantor or the issuer of the underlying security, or against the country where pledged physical assets are located.

We apply a specific approach for banking products exposures to branches of banks that are located in a country other than the legal entity's domicile. In such cases, exposures are recorded in full against the country of domicile of the counterparty and additionally in full against the country in which the branch is located.

In the case of derivatives, we show the counterparty risk associated with the positive replacement value (PRV) against the country of domicile of the counterparty (presented within traded products). In addition, the risk associated with the instantaneous fall in value of the underlying reference asset to zero (assuming no recovery) is shown against the country of domicile of the issuer of the reference asset (presented within trading inventory). This approach allows us to capture both the counterparty and, where applicable, issuer elements of risk arising from derivatives and applies comprehensively for all derivatives, including single-name credit default swaps (CDSs) and other credit derivatives.

As a basic example: if CDS protection for a notional value of 100 bought from a counterparty domiciled in country X referencing debt of an issuer domiciled in country Y has a PRV of 20, we record (i) the fair value of the CDS (20) against country X (within traded products) and (ii) the hedge benefit (notional minus fair value) of the CDS (100 – 20 = 80) against country Y (within trading inventory). In the example of protection bought, the 80 hedge benefit would offset any exposure arising from securities held and issued by the same entity as the reference asset, floored at zero per issuer. In the case of protection sold, this would be reflected as a risk exposure of 80 in addition to any exposure arising from securities held and issued by the same entity as the reference asset. In the case of derivatives referencing a basket of assets, the issuer risk against each reference entity is calculated as the expected change in fair value of the derivative given an instantaneous fall in value to zero of the corresponding reference asset (or assets) issued by that entity. Exposures are then aggregated by country across issuers, although floored at zero per issuer.

Exposures to selected eurozone countries

Our exposure to peripheral European countries remains limited, but we nevertheless remain watchful regarding the potential broader implications of adverse developments in the eurozone. As noted under "Stress testing" in this section, a eurozone crisis remains a core part of the new binding *Global Crisis scenario* for combined stress test purposes, making it central to the regular monitoring of risk exposure against the minimum capital, earnings and leverage ratio objectives in our risk appetite framework.

The "Exposures to eurozone countries rated lower than AAA / Aaa by at least one major rating agency" table on the next page provides an overview of our exposures to such rated countries as of 31 December 2019.

CDSs are primarily bought and sold in relation to our trading businesses, but are also used to hedge parts of our risk exposure, including that related to certain eurozone countries. As of 31 December 2019, and not taking into account the risk-reducing effect of master netting agreements, we had purchased USD 6 billion gross notional of single-name CDS protection on issuers domiciled in Greece, Italy, Ireland, Portugal and Spain (GIIPS) and had sold USD 7 billion gross notional of single-name CDS protection for these same countries. On a net basis, taking into account the risk-reducing effect of master netting agreements, this equates to USD 1 billion notional purchased and USD 2 billion notional sold. All gross protection purchased was from investment grade counterparties (based on our internal ratings) and on a collateralized basis. The vast majority of this was from financial institutions domiciled outside the eurozone. The gross protection purchased from counterparties domiciled in a GIIPS country was USD 50 million, with no protection purchased from counterparties domiciled in the same country as the reference entity.

Exposures to eurozone countries rated lower than AAA / Aaa by at least one major rating agency

USD million	Total		Banking products (loans, guarantees, loan commitments)			Traded products (counterparty risk from derivatives and securities financing) after master netting agreements and net of collateral		Trading inventory (securities and potential benefits / remaining exposure from derivatives)
31.12.19		Net of hedges[1]	Exposure before hedges	Net of hedges[1]	*of which: unfunded*	Exposure before hedges	Net of hedges	Net long per issuer
Austria	3,183	3,148	125	124	*84*	446	412	2,612
Sovereign, agencies and central bank	216	183	0	0		216	183	
Local governments	0	0						0
Banks	438	438	64	64		28	28	346
Other[2]	2,529	2,527	61	60		201	201	2,266
Belgium	609	609	382	382	*88*	182	182	46
Sovereign, agencies and central bank								
Local governments								
Banks	414	414	342	342		69	69	3
Other[2]	195	195	39	39		112	112	43
Finland	965	965	7	7	*3*	614	614	344
Sovereign, agencies and central bank	112	112						112
Local governments								
Banks	39	39	7	7		16	16	17
Other[2]	814	814	0	0		599	599	215
France	3,473	3,353	494	490	*405*	951	834	2,029
Sovereign, agencies and central bank	1,472	1,355				402	285	1,070
Local governments	0	0						0
Banks	847	845	188	186		100	100	560
Other[2]	1,154	1,152	306	305		449	449	399
Greece	16	8	12	4	*4*			4
Sovereign, agencies and central bank	0	0						0
Local governments								
Banks	13	5	12	4				1
Other[2]	3	3	0	0				3
Ireland[3]	884	884	338	338	*51*	58	58	488
Sovereign, agencies and central bank								
Local governments								
Banks	58	58	43	43		9	9	6
Other[2]	826	826	205	295		49	49	482
Italy	1,240	1,139	765	680	*625*	150	135	324
Sovereign, agencies and central bank	25	11				18	4	7
Local governments	53	52				53	52	
Banks	422	422	394	394		20	20	8
Other[2]	739	654	371	286		59	59	309
Portugal	94	94	26	26	*26*	59	59	9
Sovereign, agencies and central bank	47	47				47	47	
Local governments								
Banks	18	18	9	9		3	3	6
Other[2]	29	29	17	17		9	9	3
Spain	774	745	420	391	*360*	17	17	337
Sovereign, agencies and central bank	24	24						24
Local governments								
Banks	50	50	33	33		4	4	14
Other[2]	700	671	387	358	*3*	14	14	299
Other[4]	72	56	26	9		18	18	28
Total	11,310	11,001	2,594	2,451	*1,649*	2,495	2,328	6,221

1 Before deduction of IFRS 9 ECL allowances and provisions. 2 Includes corporates, insurance companies and funds. 3 The majority of the Ireland exposure relates to funds and foreign bank subsidiaries. 4 Represents aggregate exposures to Andorra, Cyprus, Estonia, Latvia, Lithuania, Malta, Monaco, Montenegro, San Marino, Slovakia and Slovenia.

Exposure from single-name credit default swaps referencing Greece, Italy, Ireland, Portugal or Spain (GIIPS)

USD million	Protection bought		of which: counterparty domiciled in GIIPS country		of which: counterparty domicile is the same as the reference entity domicile		Protection sold		Net position (after application of counterparty master netting agreements)			
31.12.19	Notional	RV	Notional	RV	Notional	RV	Notional	RV	Buy notional	Sell notional	PRV	NRV
Greece	3	0	0	0	0	0	(8)	1	0	(5)	1	0
Italy	5,585	(27)	0	0	0	0	(6,094)	(22)	791	(1,300)	23	(72)
Ireland	142	(7)	0	0	0	0	(27)	3	121	(6)	0	(5)
Portugal	116	(2)	0	0	0	0	(146)	2	62	(91)	1	(1)
Spain	462	(11)	50	0	0	0	(586)	17	173	(297)	10	(4)
Total	6,310	(48)	50	0	0	0	(6,862)	1	1,147	(1,699)	35	(82)

Holding CDSs for credit default protection does not necessarily protect the buyer of protection against losses, as the contracts will only pay out under certain scenarios. The effectiveness of our CDS protection as a hedge of default risk is influenced by a number of factors, including the contractual terms under which the CDS was written. Generally, only the occurrence of a credit event as defined by the CDS terms (which may include, among other events, failure to pay, restructuring or bankruptcy) results in a payment under the purchased credit protection contracts. For CDS contracts on sovereign obligations, repudiation can also be deemed as a default event. The determination as to whether a credit event has occurred is made by the relevant International Swaps and Derivatives Association (ISDA) determination committees (comprised of various ISDA member firms) based on the terms of the CDS and the facts and circumstances surrounding the event.

Exposure to emerging market countries

The "Emerging market net exposure by major geographical region and product type" table on the following page shows the five largest emerging market country exposures in each major geographical area by product type as of 31 December 2019 compared with 31 December 2018. Based on the sovereign rating categories, as of 31 December 2019, 79% of our emerging market country exposure was rated investment grade, compared with 84% as of 31 December 2018.

Our direct net exposure to China was USD 4.7 billion, a decrease of USD 1.6 billion compared with the prior year, mainly in the trading book. Trading inventory, which is measured at fair value, continues to account for the majority of our exposure to China.

Emerging markets net exposure[1] by internal UBS country rating category

USD million	31.12.19	31.12.18
Investment grade	13,693	15,763
Sub-investment grade	3,721	3,039
Total	17,414	18,803

1 Net of credit hedges (for banking products and for traded products); net long per issuer (for trading inventory). Before deduction of IFRS 9 ECL allowances and provisions.

Emerging market net exposures by major geographical region and product type

USD million	Total		Banking products (loans, guarantees, loan commitments)		Traded products (counterparty risk from derivatives and securities financing) after master netting agreements and net of collateral		Trading inventory (securities and potential benefits / remaining exposure from derivatives)	
	Net of hedges[1]		Net of hedges[1]		Net of hedges		Net long per issuer	
	31.12.19	31.12.18	31.12.19	31.12.18	31.12.19	31.12.18	31.12.19	31.12.18
Emerging America	1,512	1,505	613	820	368	262	531	422
Brazil	1,262	1,137	498	573	288	183	476	381
Mexico	121	174	22	102	56	56	43	16
Colombia	45	30	28	22	14	7	3	1
Argentina	22	27	17	10	0	0	5	17
Chile	20	28	9	13	8	11	2	4
Other	42	108	39	101	1	5	2	3
Emerging Asia	11,627	13,890	3,306	4,307	2,235	1,693	6,086	7,890
China	4,717	6,302	1,140	1,060	456	473	3,121	4,769
Hong Kong	2,850	2,920	1,000	1,377	823	442	1,027	1,101
South Korea	1,118	1,282	60	523	403	391	655	368
India	895	909	492	553	125	144	277	212
Thailand	616	1,176	62	147	26	25	528	1,005
Other	1,431	1,301	552	647	402	218	478	435
Emerging Europe	1,382	1,189	1,076	1,015	138	125	169	49
Russia	547	400	380	270	93	111	74	19
Turkey	398	434	359	413	4	4	34	16
Azerbaijan	186	145	184	139	0	1	2	5
Ukraine	76	53	66	50	0	0	10	3
Bulgaria	47	76	44	76	0	0	4	0
Other	128	82	42	67	40	10	46	6
Middle East and Africa	2,893	2,219	1,316	1,245	1,027	659	550	315
South Africa	668	362	176	73	129	60	363	229
United Arab Emirates	624	572	404	418	215	142	5	11
Saudi Arabia	556	275	147	166	401	108	7	0
Kuwait	277	379	56	71	222	308	0	0
Israel	190	113	37	42	51	5	102	66
Other	578	519	497	476	9	34	72	9
Total	17,414	18,803	6,311	7,387	3,767	2,739	7,335	8,676

1 Before deduction of IFRS 9 ECL allowances and provisions.

Operational risk

Key developments

The key risk themes for UBS and the financial industry overall continue to be operational resilience, conduct and financial crime.

Operational resilience remains a key focus for the firm. Our regulators have recently released consultation papers and set up working groups focused on the topic and the industry is preparing for new regulations over the coming years. We continually enhance our ability to maintain effective day-to-day business activities through the anticipation of, preparation for and response to changes in business conditions, disruption and stress scenarios. Cybersecurity, technology, data protection, third-party risk management and business continuity management are critical elements of operational resilience. Our cybersecurity objectives are set in line with international standards and our data protection and privacy standards are designed to align with applicable regulations and standards. We continue to invest in preemptive and detective measures to defend UBS against evolving and highly sophisticated cyberattacks. We focus on: (i) increasing readiness to identify and respond to cyber threats and data loss; (ii) employee training and behaviors; and (iii) application and infrastructure security (including vulnerability management).

Global policies and improved risk-based frameworks for third-party risk management have been developed and are being rolled out to all regions and business divisions. UBS has not been affected by any significant business continuity or operational resilience event in 2019. Where local events have occurred, our business continuity procedures have allowed us to ensure the safety of staff and to continue our operations with minimal disruption.

Achieving fair outcomes for our clients, upholding market integrity and cultivating the highest standards of employee conduct are of critical importance to the firm. Management of conduct risks is an integral part of our operational risk framework. We continue to focus on effectively embedding the conduct risk framework across our activities, enhancing management information and maintaining momentum on fostering a strong culture. Conduct-related management information is reviewed at the business and regional governance level, providing metrics on employee conduct, clients and markets. Employee conduct is a central consideration in the annual compensation process. Our incentive schemes distinguish clearly between quantitative performance and conduct-related behaviors, so that achievement against financial targets is not the only determinant of our employees' performance assessment. Furthermore, we continue to pursue behavioral initiatives, such as the "Principles of Good Supervision," and provide mandatory compliance and risk training.

Suitability risk, product selection, cross-divisional service offerings, quality of advice and price transparency also remain areas of heightened focus for UBS and for the industry as a whole, as low interest rates and major legislative change programs, such as Fidleg in Switzerland, Regulation Best Interest in the US, and the Markets in Financial Instruments Directive II (MiFID II) in the EU, continue to significantly impact the industry and require adjustments to control processes on a geographically aligned basis. We regularly monitor our suitability, product and conflicts of interest control frameworks to assess whether they are reasonably designed to facilitate our adherence to applicable laws and regulatory expectations.

Financial crime (including money laundering, terrorist financing, sanctions violations, fraud, bribery and corruption) continues to present a major risk, as technological innovation and geopolitical developments increase the complexity of doing business and heightened regulatory attention persists. An effective financial crime prevention program remains essential for the firm. Money laundering and financial fraud techniques are becoming increasingly sophisticated, while geopolitical volatility makes the sanctions landscape more complex. New risks are emerging, such as virtual currencies and related activities or investments.

The Office of the Comptroller of the Currency issued a Cease and Desist Order against the firm in May 2018 relating to this risk category. As a response, the firm initiated a comprehensive program for the purpose of ensuring sustainable remediation of US-relevant Bank Secrecy Act / anti-money laundering (AML) issues across all US legal entities. UBS has implemented significant improvement measures in 2019 and expects to continue implementing these measures in 2020.

We have also been focusing on strategic enhancements in the areas of AML, know your client (KYC) and sanctions on a global scale to cope with the evolving risk profile and regulatory expectations. This includes our significant investments in our detection capabilities and core systems as part of our financial crime prevention program. We are exploring new technologies to combat financial crime, and implementing more sophisticated rule-based monitoring by applying self-learning systems to identify potentially suspicious transactions. Furthermore, we continue to actively participate in AML public–private partnerships with public-sector stakeholders, including law enforcement, to improve information sharing and better detect financial crimes.

Cross-border risk remains an area of regulatory attention for global financial institutions, with a strong focus on fiscal transparency. There is evolving risk related to permanent establishment (PE) as a result of changes to the global economy and political pressure under which tax authorities are becoming increasingly demanding in asserting PEs, including retrospective application of current and future potential law concepts. The firm is actively assessing if and what further measures are required to respond to this recent focus area for authorities.

During 2018 and 2019, the firm performed a systematic review of risk themes and initiated programs to drive sustainable remediation, which have contributed to a reduction in the overall portfolio of operational risk issues and the number of new deficiencies being discovered. This trend indicates a more holistic approach to identification of operational risk issues, accountability for ownership, and focus on resolution of the underlying root causes.

Operational risk framework

Operational risk is an inherent part of the firm's business. Losses can result from inadequate or failed internal processes, people and systems, or from external causes. The operational risk definition incorporates both conduct and compliance risks. UBS defines a Group-wide framework that supports identifying, managing, assessing and mitigating operational risks to achieve an agreed balance between risk and return.

The operational risk framework establishes requirements for managing and controlling operational risks at UBS. It is built on the following pillars:

– classifying inherent risks through the operational risk taxonomy, which defines the universe of material operational risks that can arise as a consequence of the firm's business activities and external factors;
– assessing the design and operating effectiveness of controls through the control assessment process;
– proactively and sustainably remediating identified control deficiencies;
– defining operational risk appetite (including a financial operational risk appetite statement at Group and business division level for operational risk events) through quantitative metrics and thresholds and qualitative measures, and assessing risk exposure against appetite; and
– assessing inherent and residual risk through risk assessment processes, and assessing whether additional remediation plans are required to address identified deficiencies.

Divisional Presidents and accountable legal entity executives are responsible for the effectiveness of operational risk management and for the robustness of the front-to-back control environment within their respective areas. Group function heads are accountable for supporting the divisional Presidents and accountable legal entity executives of our legal entities in the discharge of this responsibility by confirming the end-to-end completeness and effectiveness of the control environment and the operational risk management within their Group function. Collectively, divisional Presidents, Group function heads and accountable legal entity executives are in charge of implementing the operational risk framework.

Compliance & Operational Risk Control (C&ORC) is responsible for providing an independent and objective view of the adequacy of operational risk management across the Group, and for ensuring that operational risks are understood, owned and managed in accordance with the firm's risk appetite. C&ORC sits within the Group Compliance, Regulatory & Governance (GCRG) function, reporting to the Group Chief Compliance and Governance Officer, who is a member of the Group Executive Board. C&ORC is an integrated function covering both operational risk as well as compliance and conduct topics. The operational risk framework forms the common basis for managing and assessing operational risk; however, there are additional C&ORC activities that are intended to ensure the firm is able to demonstrate compliance with applicable laws, rules and regulations.

In 2019, we further improved our operational risk framework, enhancing processes for sustainably remediating control deficiencies, risk management processes for UBS entities, and senior management reporting tools to better embed the framework as a key tool used by the businesses to manage their risks day to day.

All functions within the firm are required to assess the design and operating effectiveness of their internal controls periodically. The output of these assessments forms the basis for the assessment and testing of internal controls over financial reporting as required by the Sarbanes-Oxley Act, Section 404 (SOX 404).

Key control deficiencies identified during the internal control and risk assessment processes must be reported in the operational risk inventory, and sustainable remediation must be defined and executed. These control deficiencies are assigned to owners at senior management level and the remediation progress is reflected in the respective manager's annual performance measurement and management objectives. To assist with prioritizing the most material control deficiencies and measuring aggregated risk exposure, irrespective of origin, a common rating methodology is applied across all three lines of defense, as well as by external audit.

Advanced measurement approach model

The operational risk framework detailed above underpins the calculation of regulatory capital for operational risk, which enables us to quantify operational risk and to define effective risk mitigating management incentives as part of the related operational risk capital allocation approach to the business divisions.

We measure Group operational risk exposure and calculate operational risk regulatory capital by using the advanced measurement approach (AMA) in accordance with FINMA requirements.

An entity-specific AMA model has been applied for UBS Switzerland AG, while for other regulated entities the basic indicators or standardized approaches are adopted for regulatory capital in agreement with local regulators. In addition, the methodology of the Group AMA is leveraged for entity-specific Internal Capital Adequacy Assessment Processes.

Currently, the model includes 15 AMA units of measure (UoM), which are aligned with our operational risk taxonomy as closely as possible. For each of the model's UoM, frequency and severity distributions are calibrated. The modeled distribution functions for both frequency and severity are then used to generate the annual loss distribution. The resulting 99.9% quantile of the overall annual operational risk loss distribution across all UoM determines the required regulatory capital. Currently, we do not reflect mitigation through insurance or any other risk transfer mechanism in our AMA model.

AMA model calibration and review

A key assumption when calibrating the data-driven frequency and severity distributions is that historical losses form a reasonable proxy for future events. In line with regulatory expectations, the AMA methodology utilizes both historical internal losses and external losses suffered by the broader industry for the model calibration.

Initial model outputs driven by loss history are reviewed and adjusted to reflect fast-changing external developments such as new regulations, geopolitical change, volatile market and economic conditions, as well as internal factors including changes in business strategy and control framework enhancements. The resulting baseline data-driven frequency and severity distributions are reviewed by subject matter experts and where necessary adjusted based on a review of qualitative information about the business environment and internal control factors as well as expert judgment with the aim of forecasting losses.

To maintain risk sensitivity, our model is reviewed regularly and is recalibrated at least annually. Any changes to regulatory capital as a result of a recalibration or methodology changes are presented to FINMA for approval prior to their utilization for disclosure purposes.

AMA model governance

The Group and entity-specific AMA models are subject to an independent validation performed by Model Risk Management & Control (MRMC) in line with the Group's model risk management framework.

→ **Refer to "Capital management objectives, planning and activities" in the "Capital management" section of this report for more information about the development of risk-weighted assets**

→ **Refer to "Risk measurement" in this section for more information about our approach to model confirmation procedures**

→ **Refer to the "Regulatory and legal developments" and "Risk factors" sections of this report for more information**

APPENDIX 5 — OPERATING ENVIRONMENT AND STRATEGY

The information in this Appendix 5 describes the operating environment and strategy of UBS AG and references herein to "**UBS**" or the "**Group**" are to UBS AG and its subsidiaries.

The information in this Appendix 5 has been extracted from the Annual Report 2019 as at and for the year ended 31 December 2019. References to page numbers in this Appendix 5 are to pages of such document. The page numbers of such document appear on the bottom left or right hand side of the pages in this Appendix 5.

Risk factors

Certain risks, including those described below, may affect our ability to execute our strategy or our business activities, financial condition, results of operations and prospects. We are inherently exposed to multiple risks, many of which may become apparent only with the benefit of hindsight. As a result, risks that we do not consider to be material or of which we are not currently aware could also adversely affect us. Within each category, the risks that we consider to be most material are presented first.

Market and macroeconomic risks

Performance in the financial services industry is affected by market conditions and the macroeconomic climate

Our businesses are materially affected by market and macroeconomic conditions. Adverse changes in interest rates, credit spreads, securities prices, market volatility and liquidity, foreign exchange rates, commodity prices, and other market fluctuations, as well as changes in investor sentiment, can affect our earnings and ultimately our financial and capital positions.

A market downturn and weak macroeconomic conditions can be precipitated by a number of factors, including geopolitical events, global trade disruption, changes in monetary or fiscal policy, changes in trade policies, natural disasters, pandemics, civil unrest, acts of violence, war or terrorism. Such developments can have unpredictable and destabilizing effects and, because financial markets are global and highly interconnected, even local and regional events can have widespread effects well beyond the countries in which they occur. For example, the outbreak of the Covid-19 virus in China, its spread to other nations as well as quarantine and other efforts to contain the outbreak appear to have had an adverse economic effect on economic activity in China as well as on industries such as travel and tourism. The future effects of the outbreak of Covid-19 are unclear at this time. A significant rise in the number of Covid-19 infections, infections in a wide range of countries and regions, or a prolongation of the outbreak could significantly adversely affect economic growth, affect specific industries or countries or affect our employees and business operations in affected countries. Any of these developments may adversely affect our business or financial results.

If individual countries impose restrictions on cross-border payments, trade, or other exchange or capital controls, or change their currency (for example, if one or more countries should leave the eurozone), we could suffer losses from enforced default by counterparties, be unable to access our own assets, or be unable to effectively manage our risks.

Should the market experience significant volatility, a decrease in business and client activity and market volumes could result, which would adversely affect our ability to generate transaction fees, commissions and margins, particularly in Global Wealth Management and the Investment Bank, as we experienced in the fourth quarter of 2018. A market downturn would likely reduce the volume and valuation of assets that we manage on behalf of clients, which would reduce recurring fee income that is charged based on invested assets in Global Wealth Management and Asset Management and performance-based fees in Asset Management. Such a downturn could also cause a decline in the value of assets that we own and account for as investments or trading positions. In addition, reduced market liquidity or volatility may limit trading opportunities and may therefore reduce transaction-based income and may also impede our ability to manage risks.

We could be materially affected if a crisis develops, regionally or globally, as a result of disruptions in markets due to macroeconomic or political developments, or as a result of the failure of a major market participant. Over time, our strategic plans have become more heavily dependent on our ability to generate growth and revenue in emerging markets, including China, causing us to be more exposed to the risks associated with such markets.

Global Wealth Management derives revenues from all the principal regions, but has a greater concentration in Asia than many peers and a substantial presence in the US, unlike many European peers. The Investment Bank's business is more heavily weighted to Europe and Asia than our peers, while its derivatives business is more heavily weighted to structured products for wealth management clients, in particular with European and Asian underlyings. Our performance may therefore be more affected by political, economic and market developments in these regions and businesses, including the effects of the Covid-19 outbreak, than some other financial service providers.

Low and negative interest rates in Switzerland and the eurozone could continue to negatively affect our net interest income

The continuing low or negative interest rate environment may further erode interest margins and adversely affect the net interest income generated by the Personal & Corporate Banking and Global Wealth Management businesses. The Swiss National Bank permits Swiss banks to make deposits up to a threshold at zero interest and has recently increased this threshold. Any reduction in or limitation on the use of this exemption from the otherwise applicable negative interest rates could exacerbate the effect of negative interest rates in Switzerland on our business.

Low and negative interest rates may also affect customer behavior and hence our overall balance sheet structure. Mitigating actions that we have taken, or may take in the future, such as the introduction of selective deposit fees or minimum lending rates, have resulted and may further result in the loss of customer deposits (a key source of funding for us), net new money outflows and a declining market share in our Swiss lending business.

Our shareholders' equity and capital are also affected by changes in interest rates. In particular, the calculation of our Swiss pension plan's net defined benefit assets and liabilities is sensitive to the applied discount rate and to fluctuations in the value of pension plan assets. Any further reduction in interest rates may lower the discount rates and result in pension plan deficits as a result of the long duration of corresponding liabilities. This could lead to a corresponding reduction in our equity and common equity tier 1 (CET1) capital.

Our credit risk exposure to clients, trading counterparties and other financial institutions would increase under adverse economic conditions

Credit risk is an integral part of many of our activities, including lending, underwriting and derivatives activities. Adverse economic or market conditions may lead to impairments and defaults on these credit exposures. Losses may be exacerbated by declines in the value of collateral securing loans and other exposures. In our prime brokerage, securities finance and Lombard lending businesses, we extend substantial amounts of credit against securities collateral, the value or liquidity of which may decline rapidly. Our Swiss mortgage and corporate lending portfolios are a large part of our overall lending. We are therefore exposed to the risk of adverse economic developments in Switzerland, including the strength of the Swiss franc and its effect on Swiss exports, prevailing negative interest rates by the Swiss National Bank, economic conditions within the eurozone or the EU, and the evolution of agreements between Switzerland and the EU or European Economic Area, which represent Switzerland's largest export market. In addition, under the IFRS 9 expected credit loss (ECL) regime, credit loss expenses may increase rapidly at the onset of an economic downturn as a result of higher levels of credit impairments (stage 3), as well as higher ECL from stages 1 and 2, only gradually diminishing once the economic outlook improves. Substantial increases in ECL could exceed expected loss for regulatory capital purposes and adversely affect our CET1 capital and regulatory capital ratios.

Our plans to ensure uninterrupted business dealings as the UK withdraws from the EU may not be effective

Our plans to ensure uninterrupted business dealings as the UK withdraws from the EU may not be effective if the UK and the EU do not reach a deal by the end of the transition period, scheduled to end on 31 December, 2020, resulting in disruptions across the financial sector.

To prepare our business for the UK withdrawal from the EU, we completed a merger of UBS Limited, our UK-based subsidiary, into UBS Europe SE, our Germany-headquartered European subsidiary, which is under the direct supervision of the European Central Bank. All clients and counterparties of UBS Limited who would not be able to be serviced by UBS AG, London Branch following the exit of the UK from the EU have been transferred to UBS Europe SE.

Regulators in both the UK and Europe have taken measures to minimize business disruption in the financial sector in the event of a no-deal scenario, including the UK implementation of a temporary permissions regime so that firms currently using an EU passport for business into the UK can continue operating within the scope of their existing permissions, as well as the recognition by EU authorities of three UK-authorized central counterparties. Nevertheless, significant risk of a disorderly exit of the UK from the EU remains and, should this risk materialize, it could cause significant disruption across the financial industry and, under extreme conditions, contribute to a weakening of the global economy.

Currency fluctuation

We are subject to currency fluctuation risks. Although our change from the Swiss franc to the US dollar as our functional and presentation currency in 2018 reduces our exposure to currency fluctuation risks with respect to the Swiss franc, a substantial portion of our assets and liabilities are denominated in currencies other than the US dollar. Additionally, in order to hedge our CET1 capital ratio, our CET1 capital must have foreign currency exposure, which leads to currency sensitivity. As a consequence, it is not possible to simultaneously fully hedge both the amount of capital and the capital ratio. Accordingly, changes in foreign exchange rates may continue to adversely affect our profits, balance sheet and capital leverage and liquidity coverage ratios.

Regulatory and legal risks

Material legal and regulatory risks arise in the conduct of our business

As a global financial services firm operating in more than 50 countries, we are subject to many different legal, tax and regulatory regimes, including extensive regulatory oversight, and are exposed to significant liability risk. We are subject to a large number of claims, disputes, legal proceedings and government investigations, and we expect that our ongoing business activities will continue to give rise to such matters in the future. The extent of our financial exposure to these and other matters is material and could substantially exceed the level of provisions that we have established. We are not able to predict the financial and non-financial consequences these matters may have when resolved.

We may be subject to adverse preliminary determinations or court decisions that may negatively affect public perception and our reputation, result in prudential actions from regulators, and cause us to record additional provisions for the matter even when we believe we have substantial defenses and expect to ultimately achieve a more favorable outcome. This risk is illustrated by the award of aggregate penalties and damages of EUR 4.5 billion by the court of first instance in France, which we have appealed and will be retried in the Court of Appeal in June 2020.

Resolution of regulatory proceedings may require us to obtain waivers of regulatory disqualifications to maintain certain operations; may entitle regulatory authorities to limit, suspend or terminate licenses and regulatory authorizations; and may permit financial market utilities to limit, suspend or terminate our participation in them. Failure to obtain such waivers, or any limitation, suspension or termination of licenses, authorizations or participations, could have material adverse consequences for us.

Our settlements with governmental authorities in connection with foreign exchange, London Interbank Offered Rates (LIBOR) and other benchmark interest rates starkly illustrate the significantly increased level of financial and reputational risk now associated with regulatory matters in major jurisdictions. In connection with investigations related to LIBOR and other benchmark rates and to foreign exchange and precious metals, very large fines and disgorgement amounts were assessed against us, and we were required to enter guilty pleas despite our full cooperation with the authorities in the investigations, and despite our receipt of conditional leniency or conditional immunity from anti-trust authorities in a number of jurisdictions, including the US and Switzerland.

Ever since our material losses arising from the 2007–2009 financial crisis, we have been subject to a very high level of regulatory scrutiny and to certain regulatory measures that constrain our strategic flexibility. While we believe we have remediated the deficiencies that led to those losses, as well as to the unauthorized trading incident announced in September 2011, the effects on our reputation, as well as on relationships with regulatory authorities of the LIBOR-related settlements of 2012 and settlements with some regulators of matters related to our foreign exchange and precious metals business, as well as the extensive efforts required to implement new regulatory expectations, have resulted in continued scrutiny.

We are in active dialog with regulators concerning the actions we are taking to improve our operational risk management, risk control, anti-money laundering, data management and other frameworks, and otherwise seek to meet supervisory expectations, but there can be no assurance that our efforts will have the desired effects. As a result of this history, our level of risk with respect to regulatory enforcement may be greater than that of some of our peers.

Substantial changes in regulation may adversely affect our businesses and our ability to execute our strategic plans

We are subject to significant new regulatory requirements, including recovery and resolution planning, changes in capital and prudential standards, as well as new and revised market standards and fiduciary duties. Notwithstanding attempts by regulators to align their efforts, the measures adopted or proposed for banking regulation differ significantly across the major jurisdictions, making it increasingly difficult to manage a global institution. In addition, Swiss regulatory changes with regard to such matters as capital and liquidity have often proceeded more quickly than those in other major jurisdictions, and Switzerland's requirements for major international banks are among the strictest of the major financial centers. This could put Swiss banks, such as UBS, at a disadvantage when competing with peer financial institutions subject to more lenient regulation or with unregulated non-bank competitors.

Our implementation of additional regulatory requirements and changes in supervisory standards, as well as our compliance with existing laws and regulations, continue to receive heightened scrutiny from supervisors. If we do not meet supervisory expectations in relation to these or other matters, or if additional supervisory or regulatory issues arise, we would likely be subject to further regulatory scrutiny as well as measures that might further constrain our strategic flexibility.

Resolvability and resolution and recovery planning: We have moved significant operations into subsidiaries to improve resolvability and meet other regulatory requirements, and this has resulted in substantial implementation costs, increased our capital and funding costs and reduced operational flexibility. For example, we have transferred all of our US subsidiaries under a US intermediate holding company to meet US regulatory requirements, and have transferred substantially all the operations of Personal & Corporate Banking and Global Wealth Management booked in Switzerland to UBS Switzerland AG to improve resolvability.

These changes, particularly the transfer of operations to subsidiaries, require significant time and resources to implement, and create operational, capital, liquidity, funding and tax inefficiencies. In addition, they may increase our aggregate credit exposure to counterparties as they transact with multiple entities within the Group. Furthermore, our operations in subsidiaries are subject to local capital, liquidity, stable funding, capital planning and stress testing requirements. These requirements have resulted in increased capital and liquidity requirements in affected subsidiaries, which limit our operational flexibility and negatively affect our ability to benefit from synergies between business units and to distribute earnings to the Group.

Under the Swiss too-big-to-fail (TBTF) framework, we are required to put in place viable emergency plans to preserve the operation of systemically important functions in the event of a failure. Moreover, under this framework and similar regulations in the US, the UK, the EU and other jurisdictions in which we operate, we are required to prepare credible recovery and resolution plans detailing the measures that would be taken to recover in a significant adverse event or in the event of winding down the Group or the operations in a host country through resolution or insolvency proceedings. If a recovery or resolution plan that we produce is determined by the relevant authority to be inadequate or not credible, relevant regulation may permit the authority to place limitations on the scope or size of our business in that jurisdiction, or oblige us to hold higher amounts of capital or liquidity or to change our legal structure or business in order to remove the relevant impediments to resolution. FINMA is expected to make a formal determination of whether the emergency plans of Swiss systemically relevant banks are "credible" in early 2020. As a result of this review, FINMA may require us to amend the plan or put other measures in place.

Capital and prudential standards: As an internationally active Swiss systemically relevant bank (an SRB), we are subject to capital and total loss-absorbing capacity (TLAC) requirements that are among the most stringent in the world. Moreover, many of our subsidiaries must comply with minimum capital, liquidity and similar requirements and, as a result, UBS Group AG and UBS AG have contributed a significant portion of their capital and provide substantial liquidity to these subsidiaries. These funds are available to meet funding and collateral needs in the relevant entities, but are generally not readily available for use by the Group as a whole.

We expect our risk-weighted assets (RWA) to further increase as the effective date for capital standards promulgated by the Basel Committee on Banking Supervision (the BCBS) draws nearer, although the effective date of the proposals is likely to be later than 2022 contemplated by the BCBS standard. In addition, the Board of Governors of the Federal Reserve System adopted two proposals last year regarding certain capital and liquidity requirements and enhanced prudential standards applicable to foreign banking organizations (FBOs) with significant US operations. Under the proposal, it is expected that UBS Americas Holding LLC would continue to be subject to annual assessments of its capital plan through the Comprehensive Capital Analysis and Review (CCAR) process, a supplementary leverage ratio, newly applicable liquidity coverage ratio requirements and new net stable funding ratio requirements.

These additional increases in capital and liquidity standards could significantly curtail our ability to pursue strategic opportunities and to distribute risk.

Market regulation and fiduciary standards: Our wealth and asset management businesses operate in an environment of increasing regulatory scrutiny and changing standards with respect to fiduciary and other standards of care and the focus on mitigating or eliminating conflicts of interest between a manager or advisor and the client, which require effective implementation across the global systems and processes of investment managers and other industry participants. For example, the SEC has adopted a new Regulation Best Interest that is intended to enhance and clarify the duties of brokers and investment advisers to retail customers. Regulation Best Interest will apply to a large portion of Global Wealth Management's business in the US, and we will likely be required to materially change business processes, policies and the terms on which we interact with these clients in order to comply with these rules.

Previously, we have incurred substantial costs in implementing a compliance and monitoring framework in connection the with the Volcker Rule under the Dodd–Frank Act and have modified our business activities both inside and outside the US to conform to the Volcker Rule's activity limitations. In 2019, US regulators have adopted amendments (the 2019 Final Rule) to their regulations implementing the Volcker Rule prohibitions on proprietary trading and limitations on covered fund activities. The amendments were effective as of 1 January 2020 and compliance is mandatory from 1 January 2021. We may incur additional costs in the short term to implement the changes to the operation of our Volcker compliance program, required by the 2019 Final Rule. However, these changes may reduce the long-term burden on our operations. We may also become subject to other similar regulations substantively limiting the types of activities in which we may engage or the way we conduct our operations.

Some of the regulations applicable to UBS AG as a registered swap dealer with the Commodity Futures Trading Commission (CFTC) in the US, and certain regulations that will be applicable when UBS AG registers as a security-based swap dealer with the US Securities and Exchange Commission (the SEC), apply to UBS AG globally, including those relating to swap data reporting, record-keeping, compliance and supervision. As a result, in some cases, US rules duplicate or may conflict with legal requirements applicable to us elsewhere, including in Switzerland, and may place us at a competitive disadvantage to firms that are not required to register in the US with the SEC or CFTC.

In many instances, we provide services on a cross-border basis, and we are therefore sensitive to barriers restricting market access for third-country firms. In particular, efforts in the EU to harmonize the regime for third-country firms to access the European market may have the effect of creating new barriers that adversely affect our ability to conduct business in these jurisdictions from Switzerland. In addition, a number of jurisdictions are increasingly regulating cross-border activities based on determinations of equivalence of home country regulation, substituted compliance or similar principles of comity. A negative determination with respect to Swiss equivalence could limit our access to the market in those jurisdictions and may negatively influence our ability to act as a global firm. For example, the EU declined to extend the equivalence determination for Swiss exchanges, which lapsed as of 30 June 2019. Reciprocally, the regulations that Switzerland adopted to prohibit trading of shares issued by Swiss incorporated companies on EU venues came into effect on 1 July 2019.

UBS experienced cross-border outflows over a number of years as a result of heightened focus by fiscal authorities on cross-border investment and fiscal amnesty programs, in anticipation of the implementation in Switzerland of the global automatic exchange of tax information, and as a result of the measures UBS has implemented in response to these changes. Further changes in local tax laws or regulations and their enforcement, the implementation of cross-border tax information exchange regimes, national tax amnesty or enforcement programs or similar actions may affect our clients' ability or willingness to do business with us and could result in additional cross-border outflows.

Our stated capital returns objective is based, in part, on capital ratios that are subject to regulatory change and may fluctuate significantly

We plan to operate with a CET1 capital ratio of around 13% and a CET1 leverage ratio of around 3.7%. Our ability to maintain these ratios is subject to numerous risks, including the financial results of our businesses, the effect of changes to capital standards, methodologies and interpretations that may adversely affect the calculation of our CET1 ratios, the imposition of risk add-ons or capital buffers, and the application of additional capital, liquidity and similar requirements to subsidiaries. The results of our businesses may be adversely affected by events arising from other factors described herein. In some cases, such as litigation and regulatory risk and operational risk events, losses may be sudden and large. These risks could reduce the amount of capital available for return to shareholders and hinder our ability to achieve our capital returns target of a progressive cash dividend coupled with a share repurchase program.

Capital strength is a key component of our business model. Capital strength enables us to grow our businesses, and absorb increases in regulatory and capital requirements. It reassures our clients and stakeholders, forms the basis for our capital return policy and contributes to our credit ratings. Our capital ratios are driven primarily by RWA, the leverage ratio denominator and eligible capital, all of which may fluctuate based on a number of factors, some of which are outside our control.

Our eligible capital may be reduced by losses recognized within net profit or other comprehensive income. Eligible capital may also be reduced for other reasons, including acquisitions which change the level of goodwill, changes in temporary differences related to deferred tax assets included in capital, adverse currency movements affecting the value of equity, prudential adjustments that may be required due to the valuation uncertainty associated with certain types of positions, and changes in the value of certain pension fund assets and liabilities or in the interest rate and other assumptions used to calculate the changes in our net defined benefit obligation recognized in other comprehensive income.

RWA are driven by our business activities, by changes in the risk profile of our exposures, by changes in our foreign currency exposures and foreign exchange rates, and by regulation. For instance, substantial market volatility, a widening of credit spreads, adverse currency movements, increased counterparty risk, deterioration in the economic environment or increased operational risk could result in an increase in RWA. We have significantly reduced our market risk and credit risk RWA in recent years. However, increases in operational risk RWA, particularly those arising from litigation, regulatory and similar matters, and regulatory changes in the calculation of RWA, and regulatory add-ons to RWA, have offset a substantial portion of this reduction. Changes in the calculation of RWA, the imposition of additional supplemental RWA charges or multipliers applied to certain exposures and other methodology changes, as well as the implementation of the capital standards promulgated by the Basel Committee on Banking Supervision, which will take effect in 2022, could substantially increase our RWA.

The leverage ratio is a balance sheet-driven measure and therefore limits balance sheet-intensive activities, such as lending, more than activities that are less balance sheet intensive, and it may constrain our business even if we satisfy other risk-based capital requirements. Our leverage ratio denominator is driven by, among other things, the level of client activity, including deposits and loans, foreign exchange rates, interest rates and other market factors. Many of these factors are wholly or partly outside of our control.

The effect of taxes on our financial results is significantly influenced by tax law changes and reassessments of our deferred tax assets

Our effective tax rate is highly sensitive to our performance, our expectation of future profitability and statutory tax rates. Based on prior years' tax losses, we have recognized deferred tax assets (DTAs) reflecting the probable recoverable level based on future taxable profit as informed by our business plans. If our performance is expected to produce diminished taxable profit in future years, particularly in the US, we may be required to write down all or a portion of the currently recognized DTAs through the income statement in excess of anticipated amortization. This would have the effect of increasing our effective tax rate in the year in which any write-downs are taken. Conversely, if we expect the performance of entities in which we have unrecognized tax losses to improve, particularly in the US or the UK, we could potentially recognize additional DTAs. The effect of doing so would be to reduce our effective tax rate in years in which additional DTAs are recognized and to increase our effective tax rate in future years. Our effective tax rate is also sensitive to any future reductions in statutory tax rates, particularly in the US, which would cause the expected future tax benefit from items such as tax loss carry-forwards in the affected locations to diminish in value. This, in turn, would cause a write-down of the associated DTAs. For example, the reduction in the US federal corporate tax rate to 21% from 35% introduced by the US Tax Cuts and Jobs Act (TCJA) resulted in a USD 2.9 billion net write-down in the Group's DTAs in the fourth quarter of 2017.

We generally revalue our DTAs in the fourth quarter of the financial year based on a reassessment of future profitability taking into account our updated business plans. We consider the performance of our businesses and the accuracy of historical forecasts, tax rates and other factors in evaluating the recoverability of our DTAs, including the remaining tax loss carry-forward period and our assessment of expected future taxable profits over the life of DTAs. Estimating future profitability is inherently subjective and is particularly sensitive to future economic, market and other conditions, which are difficult to predict.

Our results in past years have demonstrated that changes in the recognition of DTAs can have a very significant effect on our reported results. Any future change in the manner in which UBS remeasures DTAs could affect UBS's effective tax rate, particularly in the year in which the change is made.

Our full-year effective tax rate could change if aggregate tax expenses in respect of profits from branches and subsidiaries without loss coverage differ from what is expected, or if branches and subsidiaries generate tax losses that we cannot benefit from through the income statement. In particular, losses at entities or branches that cannot offset for tax purposes taxable profits in other group entities, and which do not result in additional DTA recognition, may increase our effective tax rate. In addition, tax laws or the tax authorities in countries where we have undertaken legal structure changes may prevent the transfer of tax losses incurred in one legal entity to newly organized or reorganized subsidiaries or affiliates or may impose limitations on the utilization of tax losses that relate to businesses formerly conducted by the transferor. Were this to occur in situations where there were also limited planning opportunities to utilize the tax losses in the originating entity, the DTAs associated with such tax losses may be required to be written down through the income statement.

Changes in tax law may materially affect our effective tax rate, and, in some cases, may substantially affect the profitability of certain activities. In addition, statutory and regulatory changes, as well as changes to the way in which courts and tax authorities interpret tax laws, including assertions that we are required to pay taxes in a jurisdiction as a result of activities connected to that jurisdiction constituting a permanent establishment or similar theory, and changes in our assessment of uncertain tax positions, could cause the amount of taxes we ultimately pay to materially differ from the amount accrued.

Discontinuance of, or changes to, benchmark rates may require adjustments to our agreements with clients and other market participants, as well as to our systems and processes

Since April 2013, the UK Financial Conduct Authority (the FCA) has regulated LIBOR, and regulators in other jurisdictions have increased oversight of other interbank offered rates (IBORs) and similar benchmark rates. Efforts to transition from IBORs to alternative benchmark rates are underway in several jurisdictions. The FCA announced in July 2017 that it will not continue beyond 2021 to regulate LIBOR or take other actions to sustain LIBOR, and urged users to plan the transition to alternative reference rates. As a result, there can be no guarantee that LIBOR will be determined after 2021 on the same basis as at present, if at all.

Liquidity and activity in alternative reference rates *(ARRs)* continue to develop in markets globally, with work progressing to resolve certain issues associated with transitioning away from IBORs. Regulatory authorities continue to focus on transitioning to ARRs by the end of 2021. The Alternative Reference Rates Committee is considering potential legislative solutions that would mitigate legal risks related to legacy contracts in the event of IBOR discontinuation. In addition, in October 2019, the US Treasury Department and Internal Revenue Service published proposed regulations providing tax relief related to issues that may arise as a result of the modification of debt, derivative, and other financial contracts from LIBOR-based language to ARRs. The European Central Bank published the euro short-term rate, the risk-free rate for euro markets, for the first time on 2 October 2019, reflecting trading activity on 1 October 2019. The Bank of England Working Group on Sterling Risk-Free Reference Rates continues to be supportive of the development of a term (Sterling Overnight Index Average) reference rate.

We have a substantial number of contracts linked to IBORs. ARRs do not currently provide a term structure, which will require a change in the contractual terms of products currently indexed on terms other than overnight. In some cases, contracts may contain provisions intended to provide a fallback interest rate in the event of a brief unavailability of the relevant IBOR. These provisions may not be effective or may produce arbitrary results in the event of a permanent cessation of the relevant IBOR. In addition, numerous of our internal systems, limits and processes make use of IBORs as reference rates. Transition to replacement reference rates will require significant investment and effort.

If UBS experiences financial difficulties, FINMA has the power to open restructuring or liquidation proceedings or impose protective measures in relation to UBS Group AG, UBS AG or UBS Switzerland AG, and such proceedings or measures may have a material adverse effect on UBS's shareholders and creditors

Under the Swiss Banking Act, FINMA is able to exercise broad statutory powers with respect to Swiss banks and Swiss parent companies of financial groups, such as UBS Group AG, UBS AG and UBS Switzerland AG, if there is justified concern that the entity is over-indebted, has serious liquidity problems or, after the expiration of any relevant deadline, no longer fulfills capital adequacy requirements. Such powers include ordering protective measures, instituting restructuring proceedings (and exercising any Swiss resolution powers in connection therewith), and instituting liquidation proceedings, all of which may have a material adverse effect on shareholders and creditors or may prevent UBS Group AG, UBS AG or UBS Switzerland AG from paying dividends or making payments on debt obligations.

UBS would have limited ability to challenge any such protective measures, and creditors and shareholders would have no right under Swiss law or in Swiss courts to reject them, seek their suspension, or challenge their imposition, including measures that require or result in the deferment of payments.

If restructuring proceedings are opened with respect to UBS Group AG, UBS AG or UBS Switzerland AG, the resolution powers that FINMA may exercise include the power to: (i) transfer all or some of the assets, debt and other liabilities, and contracts of the entity subject to proceedings to another entity; (ii) stay for a maximum of two business days (a) the termination of, or the exercise of rights to terminate, netting rights, (b) rights to enforce or dispose of certain types of collateral or (c) rights to transfer claims, liabilities or certain collateral, under contracts to which the entity subject to proceedings is a party; and/or (iii) partially or fully write down the equity capital and, if such equity capital is fully written down, convert into equity or write down the capital and other debt instruments of the entity subject to proceedings. Shareholders and creditors would have no right to reject, or to seek the suspension of, any restructuring plan pursuant to which such resolution powers are exercised. They would have only limited rights to challenge any decision to exercise resolution powers or to have that decision reviewed by a judicial or administrative process or otherwise.

Upon full or partial write-down of the equity and debt of the entity subject to restructuring proceedings, the relevant shareholders and creditors would receive no payment in respect of the equity and debt that is written down, the write-down would be permanent, and the investors would not, at such time or at any time thereafter, receive any shares or other participation rights, or be entitled to any write-up or any other compensation in the event of a potential recovery of the debtor. If FINMA orders the conversion of debt of the entity subject to restructuring proceedings into equity, the securities received by the investors may be worth significantly less than the original debt and may have a significantly different risk profile, and such conversion would also dilute the ownership of existing shareholders. In addition, creditors receiving equity would be effectively subordinated to all creditors of the restructured entity in the event of a subsequent winding up, liquidation or dissolution of the restructured entity, which would increase the risk that investors would lose all or some of their investment.

FINMA has significant discretion in the exercise of its powers in connection with restructuring proceedings. Furthermore, certain categories of debt obligations, such as certain types of deposits, are subject to preferential treatment. As a result, holders of obligations of an entity subject to a Swiss restructuring proceeding may have their obligations written down or converted into equity even though obligations ranking on par with or junior to such obligations are not written down or converted.

Our financial results may be negatively affected by changes to assumptions and valuations, as well as changes to accounting standards

We prepare our consolidated financial statements in accordance with International Financial Reporting Standards (IFRS). The application of these accounting standards requires the use of judgment based on estimates and assumptions that may involve significant uncertainty at the time they are made. This is the case, for example, with respect to the measurement of fair value of financial instruments, the recognition of deferred tax assets, the assessment of the impairment of goodwill, expected credit losses and estimation of provisions for contingencies, including litigation, regulatory and similar matters. Such judgments, including the underlying estimates and assumptions, which encompass historical experience, expectations of the future and other factors, are regularly evaluated to determine their continuing relevance based on current conditions. Using different assumptions could cause the reported results to differ. Changes in assumptions, or failure to make the changes necessary to reflect evolving market conditions, may have a significant effect on the financial statements in the periods when changes occur. Estimates of provisions for contingencies may be subject to a wide range of potential outcomes and significant uncertainty. For example, the broad range of potential outcomes in UBS AG's proceeding in France increases the uncertainty associated with assessing the appropriate provision. If the estimates and assumptions in future periods deviate from the current outlook, UBS AG's financial results may also be negatively affected.

Changes to IFRS or interpretations thereof may cause future reported results and financial position to differ from current expectations, or historical results to differ from those previously reported due to the adoption of accounting standards on a retrospective basis. Such changes may also affect our regulatory capital and ratios. For example, we adopted IFRS 9 effective 1 January 2018, which required us to change the accounting treatment of financial instruments measured at amortized cost and certain other positions, to record loans from inception net of expected credit loss (ECL) allowances and provisions instead of recording credit losses on an incurred loss basis. This may result in a significant increase in recognized credit loss allowances in the future and greater volatility in the income statement as ECL changes in response to developments in the credit cycle and composition of our loan portfolio. The effect may be more pronounced in a deteriorating economic environment.

Strategy, management and operations risks

We may not be successful in the ongoing execution of our strategic plans

We have transformed UBS to focus on our Global Wealth Management business and our universal bank in Switzerland, complemented by Asset Management and a significantly smaller and more capital-efficient Investment Bank; we have substantially reduced the risk-weighted assets and leverage ratio denominator usage in Corporate Center; and made significant cost reductions. Risk remains that going forward we may not succeed in executing our strategy or achieving our performance targets, or may be delayed in doing so. Macroeconomic conditions, geopolitical uncertainty, changes to regulatory requirements and the continuing costs of meeting these requirements have prompted us to adapt our targets and ambitions in the past and we may need to do so again in the future.

To achieve our strategic plans, we expect to continue to make significant expenditures on technology and infrastructure to improve client experience, improve and further enable digital offerings and increase efficiency. Our investments in new technology may not fully achieve our objectives or improve our ability to attract and retain customers. In addition, we will likely face competition in providing digitally enabled offerings from both existing competitors and new financial service providers in various portions of the value chain. For example, technological advances and the growth of e-commerce have made it possible for e-commerce firms and other companies to offer products and services that were traditionally offered only by banks. These advances have also allowed financial institutions and other companies to provide digitally based financial solutions, including electronic securities trading, payments processing and online automated algorithmic-based investment advice at a low cost to their customers. We may have to lower our prices, or risk losing customers as a result. Our ability to develop and implement competitive digitally enabled offerings and processes will be an important factor in our ability to compete.

As part of our strategy, we seek to improve our operating efficiency, in part by controlling our costs. We may not be able to identify feasible cost reduction opportunities that are consistent with our business goals and cost reductions may be realized later or may be smaller than we anticipate. Higher temporary and permanent regulatory costs and higher business demand than anticipated have partly offset cost reductions and delayed the achievement of our past cost reduction targets, and we could continue to be challenged in the execution of our ongoing efforts to improve operating efficiency.

Changes in our workforce as a result of outsourcing, nearshoring, offshoring, insourcing or staff reductions may introduce new operational risks that, if not effectively addressed, could affect our ability to achieve cost and other benefits from such changes, or could result in operational losses.

As we implement effectiveness and efficiency programs, we may also experience unintended consequences, such as the unintended loss or degradation of capabilities that we need in order to maintain our competitive position, achieve our targeted returns or meet existing or new regulatory requirements and expectations.

Operational risks affect our business

Our businesses depend on our ability to process a large number of transactions, many of which are complex, across multiple and diverse markets in different currencies, to comply with requirements of many different legal and regulatory regimes to which we are subject and to prevent, or promptly detect and stop, unauthorized, fictitious or fraudulent transactions. We also rely on access to, and on the functioning of, systems maintained by third parties, including clearing systems, exchanges, information processors and central counterparties. Any failure of our or third-party systems could have an adverse effect on us. Our operational risk management and control systems and processes are designed to help ensure that the risks associated with our activities – including those arising from process error, failed execution, misconduct, unauthorized trading, fraud, system failures, financial crime, cyberattacks, breaches of information security, inadequate or ineffective access controls and failure of security and physical protection – are appropriately controlled. If our internal controls fail or prove ineffective in identifying and remedying these risks, we could suffer operational failures that might result in material losses, such as the substantial loss we incurred from the unauthorized trading incident announced in September 2011.

We use automation as part of our efforts to improve efficiency, reduce the risk of error and improve our client experience. We intend to expand the use of robotic processing, machine learning and artificial intelligence to further these goals. Use of these tools presents their own risks, including the need for effective design and testing; the quality of the data used for development and operation of machine learning and artificial intelligence tools may adversely affect their functioning and result in errors and other operational risks.

We and other financial services firms have been subject to breaches of security and to cyber- and other forms of attack, some of which are sophisticated and targeted attacks intended to gain access to confidential information or systems, disrupt service or destroy data. These attacks may be attempted through the introduction of viruses or malware, phishing and other forms of social engineering, distributed denial of service attacks and other means. These attempts may occur directly, or using equipment or security passwords of our employees, third-party service providers or other users. In addition to external attacks, we have experienced loss of client data from failure by employees and others to follow internal policies and procedures and from misappropriation of our data by employees and others. We may not be able to anticipate, detect or recognize threats to our systems or data and our preventative measures may not be effective to prevent an attack or a security breach. In the event of a security breach, notwithstanding our preventative measures, we may not immediately detect a particular breach or attack. Once a particular attack is detected, time may be required to investigate and assess the nature and extent of the attack. A successful breach or circumvention of security of our systems or data could have significant negative consequences for us, including disruption of our operations, misappropriation of confidential information concerning us or our customers, damage to our systems, financial losses for us or our customers, violations of data privacy and similar laws, litigation exposure and damage to our reputation.

We are subject to complex and frequently changing laws and regulations governing the protection of client and personal data, such as the EU General Data Protection Regulation. Ensuring that we comply with applicable laws and regulations when we collect, use and transfer personal information requires substantial resources and may affect the ways in which we conduct our business. In the event that we fail to comply with applicable laws, we may be exposed to regulatory fines and penalties and other sanctions. We may also incur such penalties if our vendors or other service providers or clients or counterparties fail to comply with these laws or to maintain appropriate controls over protected data. In addition, any loss or exposure of client or other data may adversely damage our reputation and adversely affect our business.

A major focus of US and other countries' governmental policies relating to financial institutions in recent years has been on fighting money laundering and terrorist financing. We are required to maintain effective policies, procedures and controls to detect, prevent and report money laundering and terrorist financing, and to verify the identity of our clients under the laws of many of the countries in which we operate. We are also subject to laws and regulations related to corrupt and illegal payments to government officials by others, such as the US Foreign Corrupt Practices Act and the UK Bribery Act. We have implemented policies, procedures and internal controls that are designed to comply with such laws and regulations. Notwithstanding this, US regulators have found deficiencies in the design and operation of anti-money laundering programs in our US operations. We have undertaken a significant program to address these regulatory findings with the objective of fully meeting regulatory expectations for our programs. Failure to maintain and implement adequate programs to combat money laundering, terrorist financing or corruption, or any failure of our programs in these areas, could have serious consequences both from legal enforcement action and from damage to our reputation. Frequent changes in sanctions imposed and increasingly complex sanctions imposed on countries, entities and individuals increase our cost of monitoring and complying with sanctions requirements and increase the risk that we will not identify in a timely manner previously permissible client activity that is subject to a sanction.

As a result of new and changed regulatory requirements and the changes we have made in our legal structure, the volume, frequency and complexity of our regulatory and other reporting has significantly increased. Regulators have also significantly increased expectations regarding our internal reporting and data aggregation, as well as management reporting. We have incurred and continue to incur significant costs to implement infrastructure to meet these requirements. Failure to meet external reporting requirements accurately and in a timely manner or failure to meet regulatory expectations of internal reporting, data aggregation and management reporting could result in enforcement action or other adverse consequences for us.

Certain types of operational control weaknesses and failures could also adversely affect our ability to prepare and publish accurate and timely financial reports.

In addition, despite the contingency plans that we have in place, our ability to conduct business may be adversely affected by a disruption in the infrastructure that supports our businesses and the communities in which we operate. This may include a disruption due to natural disasters, pandemics, civil unrest, war or terrorism and involve electrical, communications, transportation or other services that we use or that are used by third parties with whom we conduct business.

We may not be successful in implementing changes in our wealth management businesses to meet changing market, regulatory and other conditions

In recent years, inflows from lower-margin segments and markets have been replacing outflows from higher-margin segments and markets, in particular for cross-border clients. This dynamic, combined with changes in client product preferences as a result of which low-margin products account for a larger share of our revenues than in the past, has put downward pressure on Global Wealth Management's margins.

As the discussion above indicates, we are exposed to possible outflows of client assets in our asset-gathering businesses and to changes affecting the profitability of Global Wealth Management, in particular. Initiatives that we may implement to overcome the effects of changes in the business environment on our profitability, balance sheet and capital positions may not succeed in counteracting those effects and may cause net new money outflows and reductions in client deposits, as happened with our balance sheet and capital optimization program in 2015. There is no assurance that we will be successful in our efforts to offset the adverse effect of these or similar trends and developments.

We may be unable to identify or capture revenue or competitive opportunities, or retain and attract qualified employees

The financial services industry is characterized by intense competition, continuous innovation, restrictive, detailed, and sometimes fragmented regulation and ongoing consolidation. We face competition at the level of local markets and individual business lines, and from global financial institutions that are comparable to us in their size and breadth. Barriers to entry in individual markets and pricing levels are being eroded by new technology. We expect these trends to continue and competition to increase. Our competitive strength and market position could be eroded if we are unable to identify market trends and developments, do not respond to such trends and developments by devising and implementing adequate business strategies, do not adequately develop or update our technology including our digital channels and tools, or are unable to attract or retain the qualified people needed.

The amount and structure of our employee compensation is affected not only by our business results, but also by competitive factors and regulatory considerations.

In recent years, in response to the demands of various stakeholders, including regulatory authorities and shareholders, and in order to better align the interests of our staff with other stakeholders, we have increased average deferral periods for stock awards, expanded forfeiture provisions and, to a more limited extent, introduced clawback provisions for certain awards linked to business performance. We have also introduced individual caps on the proportion of fixed to variable pay for the Group Executive Board (GEB) members, as well as certain other employees.

Constraints on the amount or structure of employee compensation, higher levels of deferral, performance conditions and other circumstances triggering the forfeiture of unvested awards may adversely affect our ability to retain and attract key employees. The loss of key staff and the inability to attract qualified replacements could seriously compromise our ability to execute our strategy and to successfully improve our operating and control environment, and could affect our business performance. Swiss law requires that shareholders approve the compensation of the Board of Directors (the BoD) and the GEB each year. If our shareholders fail to approve the compensation for the GEB or the BoD, this could have an adverse effect on our ability to retain experienced directors and our senior management.

We depend on our risk management and control processes to avoid or limit potential losses in our businesses

Controlled risk-taking is a major part of the business of a financial services firm. Some losses from risk-taking activities are inevitable, but to be successful over time, we must balance the risks we take against the returns generated. Therefore we must diligently identify, assess, manage and control our risks, not only in normal market conditions but also as they might develop under more extreme, stressed conditions, when concentrations of exposures can lead to severe losses.

As seen during the financial crisis of 2007–2009, we have not always been able to prevent serious losses arising from extreme or sudden market events that are not anticipated by our risk measures and systems. Our risk measures, concentration controls and the dimensions in which we aggregated risk to identify correlated exposures proved inadequate in a historically severe deterioration in financial markets. As a result, we recorded substantial losses on fixed income trading positions, particularly in 2008 and 2009. We have substantially revised and strengthened our risk management and control framework and increased the capital that we hold relative to the risks that we take. Nonetheless, we could suffer further losses in the future if, for example:

- we do not fully identify the risks in our portfolio, in particular risk concentrations and correlated risks;
- our assessment of the risks identified, or our response to negative trends, proves to be untimely, inadequate, insufficient or incorrect;
- markets move in ways that we do not expect – in terms of their speed, direction, severity or correlation – and our ability to manage risks in the resulting environment is, therefore, affected;
- third parties to whom we have credit exposure or whose securities we hold are severely affected by events and we suffer defaults and impairments beyond the level implied by our risk assessment; or
- collateral or other security provided by our counterparties proves inadequate to cover their obligations at the time of default.

We have exposures related to real estate in various countries, including a substantial Swiss mortgage portfolio. Although we believe this portfolio is prudently managed, we could nevertheless be exposed to losses if a substantial deterioration in the Swiss real estate market were to occur. We also hold legacy risk positions, primarily in Corporate Center, that, in many cases, are illiquid and may again deteriorate in value.

We also manage risk on behalf of our clients. The performance of assets we hold for our clients may be adversely affected by the same factors mentioned above. If clients suffer losses or the performance of their assets held with us is not in line with relevant benchmarks against which clients assess investment performance, we may suffer reduced fee income and a decline in assets under management, or withdrawal of mandates.

Investment positions, such as equity investments made as part of strategic initiatives and seed investments made at the inception of funds that we manage, may also be affected by market risk factors. These investments are often not liquid and generally are intended or required to be held beyond a normal trading horizon. Deteriorations in the fair value of these positions would have a negative effect on our earnings.

As UBS Group AG is a holding company, its operating results, financial condition and ability to pay dividends and other distributions and/or to pay its obligations in the future depend on funding, dividends and other distributions received directly or indirectly from its subsidiaries, which may be subject to restrictions

UBS Group AG's ability to pay dividends and other distributions and to pay its obligations in the future will depend on the level of funding, dividends and other distributions, if any, received from UBS AG and other subsidiaries. The ability of such subsidiaries to make loans or distributions, directly or indirectly, to UBS Group AG may be restricted as a result of several factors, including restrictions in financing agreements and the requirements of applicable law and regulatory, fiscal or other restrictions. In particular, UBS Group AG's direct and indirect subsidiaries, including UBS AG, UBS Switzerland AG, UBS Americas Holding LLC and UBS Europe SE, are subject to laws and regulations that restrict dividend payments, authorize regulatory bodies to block or reduce the flow of funds from those subsidiaries to UBS Group AG, or could affect their ability to repay any loans made to, or other investments in, such subsidiary by UBS Group AG or another member of the Group. For example, the US Comprehensive Capital Analysis and Review process requires that our US intermediate holding company demonstrate that it can continue to meet minimum capital standards over a hypothetical nine-quarter severely adverse economic scenario. If it fails to meet the quantitative capital requirements, or the Federal Reserve Board's qualitative assessment of the capital planning process is adverse, our US intermediate holding company would be prohibited from paying dividends or making distributions. Restrictions and regulatory actions of this kind could impede access to funds that UBS Group AG may need to meet its obligations or to pay dividends to shareholders. In addition, UBS Group AG's right to participate in a distribution of assets upon a subsidiary's liquidation or reorganization is subject to all prior claims of the subsidiary's creditors.

Our capital instruments may contractually prevent UBS Group AG from proposing the distribution of dividends to shareholders, other than in the form of shares, if we do not pay interest on these instruments.

Furthermore, UBS Group AG may guarantee some of the payment obligations of certain of the Group's subsidiaries from time to time. These guarantees may require UBS Group AG to provide substantial funds or assets to subsidiaries or their creditors or counterparties at a time when UBS Group AG is in need of liquidity to fund its own obligations.

The credit ratings of UBS Group AG or its subsidiaries used for funding purposes could be lower than the ratings of the Group's operating subsidiaries, which may adversely affect the market value of the securities and other obligations of UBS Group AG or those subsidiaries on a standalone basis.

Our reputation is critical to our success

Our reputation is critical to the success of our strategic plans, business and prospects. Reputational damage is difficult to reverse, and improvements tend to be slow and difficult to measure. Our reputation has been adversely affected by our losses during the financial crisis, investigations into our cross-border private banking services, criminal resolutions of LIBOR-related and foreign exchange matters, as well as other matters. We believe that reputational damage as a result of these events was an important factor in our loss of clients and client assets across our asset-gathering businesses. New events that cause reputational damage could have a material adverse effect on our results of operation and financial condition, as well as our ability to achieve our strategic goals and financial targets.

Liquidity and funding risk

Liquidity and funding management are critical to UBS's ongoing performance

The viability of our business depends on the availability of funding sources, and our success depends on our ability to obtain funding at times, in amounts, for tenors and at rates that enable us to efficiently support our asset base in all market conditions. Our funding sources have generally been stable, but could change in the future because of, among other things, general market disruptions or widening credit spreads, which could also influence the cost of funding. A substantial part of our liquidity and funding requirements are met using short-term unsecured funding sources, including retail and wholesale deposits and the regular issuance of money market securities. A change in the availability of short-term funding could occur quickly.

Moreover, more stringent capital and liquidity and funding requirements will likely lead to increased competition for both secured funding and deposits as a stable source of funding, and to higher funding costs. The addition of loss-absorbing debt as a component of capital requirements, the regulatory requirements to maintain minimum TLAC at UBS's holding company and at subsidiaries, as well as the power of resolution authorities to bail in TLAC and other debt obligations, and uncertainty as to how such powers will be exercised, will increase our cost of funding and could potentially increase the total amount of funding required, in the absence of other changes in our business.

Reductions in our credit ratings may adversely affect the market value of the securities and other obligations and increase our funding costs, in particular with regard to funding from wholesale unsecured sources, and could affect the availability of certain kinds of funding. In addition, as experienced in connection with Moody's downgrade of UBS AG's long-term debt rating in June 2012, rating downgrades can require us to post additional collateral or make additional cash payments under trading agreements. Our credit ratings, together with our capital strength and reputation, also contribute to maintaining client and counterparty confidence, and it is possible that rating changes could influence the performance of some of our businesses.

The requirement to maintain a liquidity coverage ratio of high-quality liquid assets to estimated stressed short-term net cash outflows, and other similar liquidity and funding requirements, oblige us to maintain high levels of overall liquidity, limit our ability to optimize interest income and expense, make certain lines of business less attractive and reduce our overall ability to generate profits. The liquidity coverage ratio and net stable funding ratio requirements are intended to ensure that we are not overly reliant on short-term funding and that we have sufficient long-term funding for illiquid assets. The relevant calculations make assumptions about the relative likelihood and amount of outflows of funding and available sources of additional funding in market-wide and firm-specific stress situations. There can be no assurance that in an actual stress situation our funding outflows would not exceed the assumed amounts.

APPENDIX 6 — A BRIEF GUIDE TO CREDIT RATINGS

Information set out in this Appendix 6 is based on, extracted or reproduced from the website of S&P at https://www.spglobal.com/ratings/en/about/understanding-ratings and the website of Moody's at https://www.moodys.com, as of the day immediately preceding the date of this Base Listing Document. Information appearing on those websites does not form part of this Base Listing Document, and we accept no responsibility for the accuracy or completeness of the information appearing on those websites, except that we have accurately extracted and reproduced such information in this Appendix 6 and take responsibility for such extraction and reproduction. We have not separately verified such information. There can be no assurance that such information will not be revised by the relevant rating agency in the future and we have no responsibility to notify you of such change. If you are unsure about any information provided in this Appendix 6 and/or what a credit rating means, you should seek independent professional advice.

What is a credit rating?

A credit rating is a forward looking opinion by a credit rating agency of a company's overall ability to meet its financial obligations. The focus is on the company's capacity to pay its debts as they become due. The rating does not necessarily apply to any specific obligation.

What do the credit ratings mean?

Below are guidelines issued by S&P and Moody's on what each of their investment-grade ratings means, as of the day immediately preceding the date of this Base Listing Document.

S&P long-term issuer credit ratings

AAA

An obligor rated 'AAA' has extremely strong capacity to meet its financial commitments. 'AAA' is the highest issuer credit rating assigned by S&P.

AA

An obligor rated 'AA' has very strong capacity to meet its financial commitments.

A

An obligor rated 'A' has strong capacity to meet its financial commitments but is somewhat susceptible to adverse economic conditions and changes in circumstances.

BBB

An obligor rated 'BBB' has adequate capacity to meet its financial commitments, but is more subject to adverse economic conditions.

Plus (+) or minus (-)

The above ratings (except for 'AAA') may be modified by the addition of a plus or minus sign to show relative standing within the major rating categories.

Please refer to https://www.spglobal.com/ratings/en/about/understanding-ratings for further details.

Moody's long-term ratings definitions

Aaa

Obligations rated Aaa are judged to be of the highest quality, subject to the lowest level of credit risk.

Aa

Obligations rated Aa are judged to be of high quality and are subject to very low credit risk.

A

Obligations rated A are judged to be upper-medium grade and are subject to low credit risk.

Baa

Obligations rated Baa are judged to be medium-grade and subject to moderate credit risk and as such may possess certain speculative characteristics.

Modifiers "1", "2" and "3"

Moody's appends numerical modifiers 1, 2 and 3 to each of the above generic rating classifications (except for Aaa). The modifier 1 indicates that the obligation ranks in the higher end of its generic rating category; the modifier 2 indicates a mid-range ranking; and the modifier 3 indicates a ranking in the lower end of that generic rating category.

Please refer to https://www.moodys.com/Pages/amr002002.aspx for further details.

Rating Outlooks

A rating outlook indicates the potential direction of a long-term credit rating over the intermediate term (for example, this is typically six months to two years for S&P). A rating outlook issued by S&P or Moody's will usually indicate whether the potential direction is likely to be "positive", "negative", "stable" or "developing". Please refer to the abovementioned websites of the relevant credit rating agencies for further details regarding rating outlooks published by the relevant credit rating agencies.

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