



DEUTSCHE BÖRSE
GROUP

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Consolidated income statement

for the period 1 January to 31 December 2019

		2019 €m	2018 ¹⁾ €m
Sales revenue	4	3,054.2	2,899.2
Net interest income from banking business	4	246.1	204.5
Other operating income	4	15.1	28.7
Total revenue		3,315.4	3,132.4
Volume-related costs	4	-379.4	-352.7
Net revenue (total revenue less volume-related costs)		2,936.0	2,779.7
Staff costs	5	-747.8	-824.0
Other operating expenses	6	-516.6	-516.2
Operating costs		-1,264.4	-1,340.2
Net income from strategic investments	8	6.7	4.2
Earnings before interest, tax, depreciation and amortisation (EBITDA)		1,678.3	1,443.7
Depreciation, amortisation and impairment losses	11, 12	-226.2	-210.5
Earnings before interest and tax (EBIT)		1,452.1	1,233.2
Financial income	9	10.7	7.4
Financial expense	9	-64.4	-83.8
Earnings before tax (EBT)		1,398.4	1,156.8
Other tax		-0.4	-0.6
Income tax expense	10	-362.6	-303.7
Net profit for the period		1,035.4	852.5
Net profit for the period attributable to Deutsche Börse AG shareholders		1,003.9	824.3
Net profit for the period attributable to non-controlling interests		31.5	28.2
Earnings per share (basic) (€)	21	5.47	4.46
Earnings per share (diluted) (€)	21	5.47	4.46

1) In context of the harmonization of the presentation of connection and maintenance fees, €5.3 million were reclassified from other operating income to sales revenue.

Consolidated statement of comprehensive income

for the period 1 January to 31 December 2019

	Note	2019 €m	2018 €m
Net profit for the period reported in consolidated income statement		1,035.4	852.5
Items that will not be reclassified to profit or loss:			
Changes from defined benefit obligations		-42.1	-23.9
Equity investments measured at fair value through OCI		-10.4	-7.2
Other		-0.9	-0.3
Deferred taxes	10	11.3	6.8
		-42.1	-24.6
Items that may be reclassified subsequently to profit or loss:			
Exchange rate differences	15	-1.8	12.8
Other comprehensive income from investments using the equity method		-0.4	-0.4
Remeasurement of cash flow hedges		0.2	0
Deferred taxes	10	0	-3.9
		-2.0	8.5
Other comprehensive income after tax		-44.1	-16.1
Total comprehensive income		991.3	836.4
thereof Deutsche Börse AG shareholders		960.6	806.4
thereof non-controlling interests		30.7	30.0

Consolidated balance sheet

as at 31 December 2019

Assets

	Note	31 Dec 2019 €m	1 Jan 2019 ¹⁾ €m	31 Dec 2018 €m
NON-CURRENT ASSETS				
Intangible assets	11			
Software		404.5	321.0	321.0
Goodwill		3,470.5	2,865.6	2,865.6
Payments on account and software in development		92.5	52.3	52.3
Other intangible assets		1,040.9	952.7	952.7
		5,008.4	4,191.6	4,191.6
Property, plant and equipment	12			
Land and buildings		346.5	258.3	0
Fixtures and fittings		39.8	31.3	31.3
Computer hardware, operating and office equipment as well as car pool		95.9	89.3	84.8
Payments on account and construction in progress		15.8	14.8	14.8
		498.0	393.7	130.9
Financial assets	13			
Equity investments measured at FVOCI		66.3	108.8	108.8
Debt financial assets measured at amortised cost		698.7	1,057.1	1,057.1
Financial assets at FVPL				
Financial instruments held by central counterparties		5,234.2	9,985.4	9,985.4
Other financial debt assets at FVPL		28.4	17.3	17.3
		6,027.6	11,168.6	11,168.6
Investment in associates and joint ventures		44.5	42.5	42.5
Other non-current assets		4.0	4.1	4.1
Deferred tax assets	10	124.4	107.1	104.3
Total non-current assets		11,706.9	15,907.6	15,642.0
CURRENT ASSETS				
Debt Financial assets measured at amortised cost	13			
Trade Receivables		447.3	397.5	397.5
Other financial assets at amortised cost		15,381.6	19,722.6	19,722.6
Restricted bank balances		29,988.7	29,833.6	29,833.6
Other cash and bank balances		888.1	1,322.3	1,322.3
Financial assets at FVPL	13			
Financial instruments held by central counterparties		78,301.5	94,280.3	94,280.3
Derivatives		1.4	4.7	4.7
Other financial assets at FVPL		0.4	0.4	0.4
Income tax assets		108.5	55.9	55.9
Other current assets	14	340.9	639.8	639.8
Total current assets		125,458.4	146,257.1	146,257.1
Total assets		137,165.3	162,164.7	161,899.1

Equity and liabilities

	Note	31 Dec 2019 €m	1 Jan 2019 ¹⁾ €m	31 Dec 2018 ²⁾ €m
EQUITY	15			
Subscribed capital		190.0	190.0	190.0
Share premium		1,344.7	1,340.4	1,340.4
Treasury shares		-471.8	-477.7	-477.7
Revaluation surplus		-52.1	-10.2	-10.2
Accumulated profit		4,724.5	3,779.4	3,787.4
Shareholders' equity		5,735.3	4,821.9	4,829.9
Non-controlling interests		375.3	133.5	133.5
Total equity		6,110.6	4,955.4	4,963.4
NON-CURRENT LIABILITIES				
Provisions for pensions and other employee benefits	17	193.5	164.1	164.1
Other non-current provisions	18	225.2	209.9	209.9
Financial liabilities measured at amortised cost	13	2,627.2	2,539.4	2,283.2
Financial liabilities at FVPL	13			
Financial instruments held by central counterparties		5,234.2	9,985.4	9,985.4
Other Financial liabilities at FVPL		84.3	0.2	0.2
Other non-current liabilities		19.7	17.0	17.0
Deferred tax liabilities	10	226.3	194.5	194.5
Total non-current liabilities		8,610.4	13,110.5	12,854.3
CURRENT LIABILITIES				
Income tax liabilities ³⁾		231.8	295.8	295.8
Other current provisions	18	250.7	306.6	306.6
Financial liabilities at amortised cost	13			
Trade payables		206.7	195.0	195.0
Other financial liabilities at amortised cost		14,225.4	19,047.8	19,024.7
Cash deposits by market participants		29,755.8	29,559.2	29,559.2
Financial liabilities at FVPL	13			
Financial instruments held by central counterparties		77,411.5	94,068.3	94,068.3
Derivatives		25.9	3.0	3.0
Other financial liabilities at FVPL		3.6	0	0
Other current liabilities	19	332.9	623.1	628.8
Total current liabilities		122,444.3	144,098.8	144,081.4
Total liabilities		131,054.7	157,209.3	156,935.7
Total equity and liabilities		137,165.3	162,164.7	161,899.1

1) Figures as at 01.01.2019 adjusted

2) Prior year figures adjusted

3) Thereof non-current: €101.9 million (2018: €79.0 million)

Consolidated cash flow statement

for the period 1 January to 31 December 2019

	Note	2019 €m	2018 €m
Net profit for the period		1,035.4	852.5
Depreciation, amortisation and impairment losses	11, 12	226.2	210.5
Increase in non-current provisions		5.9	59.7
Deferred tax income	10	-15.4	-36.0
Other non-cash income		52.5	-21.3
Changes in working capital, net of non-cash items:		-273.0	105.7
(Increase)/decrease in receivables and other assets		-106.4	-8.8
Increase/(decrease) in current liabilities		-159.2	113.6
Increase in non-current liabilities		-7.4	0.9
Net loss/(gain) on disposal of non-current assets		-1.0	5.4
Cash flows from operating activities excluding CCP positions		1,030.6	1,176.5
Changes in liabilities from CCP positions		1,895.7	-1,676.0
Changes in receivables from CCP positions		-2,000.2	1,797.7
Cash flows from operating activities	20	926.1	1,298.2
Payments to acquire intangible assets		-123.0	-94.8
Payments to acquire property, plant and equipment		-61.9	-65.2
Payments to acquire non-current financial instruments		-226.5	-38.7
Payments to acquire investments in associates and joint ventures		-9.5	-4.8
Payments to acquire subsidiaries, net of cash acquired		-666.4	-169.2
Effects of the disposal of (shares in) subsidiaries, net of cash disposed		0.1	-0.4
Net decrease/(net increase) in current receivables and securities from banking business with an original term greater than three months		371.4	655.1
Effects of the disposal of (shares in) associates		4.7	0
Net increase in current liabilities from banking business with an original term greater than three months		-62.3	250.3
Proceeds from disposals of non-current financial instruments		47.8	259.5
Proceeds from disposals of intangible assets		2.6	0.2
Cash flows from investing activities	20	-722.9	792.0
Purchase of treasury shares		0	-364.2
Proceeds from sale of treasury shares		6.2	6.5
Payments to non-controlling interests		-24.5	-14.9
Proceeds from non-controlling interests		655.3	0.6
Repayment of long-term financing		0	-600.0
Proceeds from long-term financing		0	592.4
Net payments from leases (IFRS 16)		-42.6	0
Dividends paid		-495.0	-453.3
Cash flows from financing activities	20	99.4	-832.9
Net change in cash and cash equivalents		302.6	1,257.3

	Note	2019 €m	2018 €m
Net change in cash and cash equivalents (brought forward)		302.6	1,257.3
Effect of exchange rate differences		3.9	1.5
Cash and cash equivalents at beginning of period		1,839.0	580.2
Cash and cash equivalents at end of period	20	2,145.5	1,839.0
Interest-similar income received		540.1	435.1
Dividends received		4.7	6.7
Interest paid		-323.0	-312.0
Income tax paid		-494.1	-303.3

Consolidated statement of changes in equity

for the period 1 January to 31 December 2019

	Attributable to owners of Deutsche Börse AG		
	Subscribed capital €m	Share premium €m	Treasury shares €m
Balance as at 1 January 2018	193.0	1,332.3	-334.6
Net profit for the period	0	0	0
Other comprehensive income after tax	0	0	0
Total comprehensive income	0	0	0
Exchange rate differences and other adjustments	0	0	0
Purchase of treasury shares	0	0	-364.2
Sale of treasury shares	0	5.1	0
Retirement of treasury shares	-3.0	3.0	215.4
Sales under the Group Share Plan	0	0	5.7
Changes due to capital increases/decreases	0	0	0
Dividends paid	0	0	0
Transactions with shareholders	-3.0	8.1	-143.1
Balance as at 31 December 2018	190.0	1,340.4	-477.7
Initial application of IFRS 16 at 1 January 2019	0	0	0
Balance as at 1 January 2019	190.0	1,340.4	-477.7
Profit for the period	0	0	0
Other comprehensive income	0	0	0
Total comprehensive income	0	0	0
Exchange rate differences and other adjustments	0	0	0
Sale of treasury shares	0	4.3	0
Sales under the Group Share Plan	0	0	5.9
Changes due to capital increases/decreases	0	0	0
Changes from defined benefit obligations	0	0	0
Dividends paid	0	0	0
Transactions with shareholders	0	4.3	5.9
Balance as at 31 December 2019	190.0	1,344.7	-471.8

Attributable to owners of Deutsche Börse AG					
	Revaluation surplus €m	Accumulated profit €m	Shareholders' equity €m	Non-controlling interests €m	Total equity €m
	14.4	3,624.2	4,829.3	118.1	4,947.4
	0	824.3	824.3	28.2	852.5
	-24.6	6.7	-17.9	1.8	-16.1
	-24.6	831.0	806.4	30.0	836.4
	0	0.9	0.9	0.3	1.2
	0	0	-364.2	0	-364.2
	0	0	5.1	0	5.1
	0	-215.4	0	0	0
	0	0	5.7	0	5.7
	0	0	0	-14.9	-14.9
	0	-453.3	-453.3	0	-453.3
	0	-667.8	-805.8	-14.6	-820.4
	-10.2	3,787.4	4,829.9	133.5	4,963.4
	0	-8.0	-8.0	0	-8.0
	-10.2	3,779.4	4,821.9	133.5	4,955.4
	0	1,003.9	1,003.9	31.5	1,035.4
	-41.9	-1.4	-43.3	-0.8	-44.1
	-41.9	1,002.5	960.6	30.7	991.3
	0	13.5	13.5	-0.8	12.7
	0	0	4.3	0	4.3
	0	0	5.9	0	5.9
	0	0	0	-24.5	-24.5
	0	424.1	424.1	236.4	660.5
	0	-495.0	-495.0	0	-495.0
	0	-57.4	-47.2	211.1	163.9
	-52.1	4,724.5	5,735.3	375.3	6,110.6

Notes to the consolidated financial statements

Basis of preparation

1. General principles

Company information

Deutsche Börse AG is the parent company of Deutsche Börse Group. Deutsche Börse AG (the “company”) has its registered office in Frankfurt/Main, and is registered in the commercial register B of the Frankfurt/Main Local Court (Amtsgericht Frankfurt am Main) under HRB 32232. Deutsche Börse AG and its subsidiaries operate cash and derivatives markets. Its business areas range from pre-IPO and growth financing services, the admission of securities to listing, through trading, clearing and settlement, down to custody of securities. Furthermore, IT services are provided and market information distributed. Moreover, certain subsidiaries of Deutsche Börse AG own a banking license and offer banking services to customers. For details regarding internal organisation and reporting, see [note 22](#).

Basis of reporting

The 2019 consolidated financial statements have been prepared in compliance with the International Financial Reporting Standards (IFRS) issued by the International Accounting Standards Board (IASB) and the related interpretations issued by the International Financial Reporting Interpretations Committee (IFRIC), as adopted by the European Union in accordance with Regulation No. 1606/2002 of the European Parliament and of the Council on the application of international accounting standards.

The disclosures required in accordance with the Handelsgesetzbuch (HGB, German Commercial Code) section 315e (1) have been presented in the notes to the consolidated financial statements and the [remuneration report of the combined management report](#).

The consolidated income statement is structured using the nature of expense method.

Deutsche Börse AG’s consolidated financial statements have been prepared in euros, the functional currency of Deutsche Börse AG. Unless stated otherwise, all amounts are shown in millions of euros (€m). Due to rounding, actual amounts may differ from unrounded or disclosed figures. This may cause slight deviations from the figures disclosed in the previous year.

Going forward, Deutsche Börse will present all accounting policies, estimates, measurement uncertainties as well as discretionary judgements referring to a specific subject matter in the corresponding note, together with other disclosures relevant to the subject matter. Such disclosures are focused on applicable accounting options under IFRSs. Deutsche Börse Group does not disclose the underlying published IFRS guidelines, unless this is considered crucial to enhance transparency. The annual financial statements of subsidiaries included in the consolidated financial statements have been prepared on the basis of the Group-wide accounting policies based on IFRS that are described in the following. They were applied consistently to the periods shown.

New accounting standards – implemented in the year under review

In the 2019 reporting period, the following standards and interpretations issued by the IASB and adopted by the European Commission were applied to Deutsche Börse Group for the first time.

Standard/Amendment/Interpretation

		Application date	Effects at Deutsche Börse Group
IFRS 9	Amendment “Prepayment Features with Negative Compensation”	01 Jan 2019	none
IFRS 16	Leases	01 Jan 2019	See note 3
IAS 19	Amendment “Plan Amendment, Curtailment or Settlement”	01 Jan 2019	none
IAS 28	Amendment “Long-term investments in Associates and Joint Ventures”	01 Jan 2019	none
IFRIC 23	Uncertainty over Income Tax Treatments	01 Jan 2019	none
	Amendments resulting from the Annual Improvements Project 2015-2017 - amendments to IFRS 3, IFRS 11, IAS 12, IAS 23	01 Jan 2019	non-material

New accounting standards – not yet implemented

The IASB issued the following new or amended Standards and Interpretations, which were not applied in the 2019 consolidated financial statements, because endorsement by the EU was still pending or the application was not mandatory. The new or amended Standards and Interpretations must be applied for financial years beginning on or after the effective date. Even though early application may be permitted for some standards, Deutsche Börse Group does usually not use any early application options.

Standard/Amendment/Interpretation

		Application date	Effects at Deutsche Börse Group
IFRS 3	Amendment: Definition of a Business	01 Jan 2020	non-material
IFRS 17	Insurance Contracts	01 Jan 2021	See notes under this table
IAS 1, IAS 8	Amendment: Definition of Material	01 Jan 2020	non-material
	Revised Framework	01 Jan 2020	non-material

IFRS 17 “Insurance Contracts”

IFRS 17 establishes the principles for the recognition, measurement, presentation and disclosure of insurance contracts. The objective of IFRS 17 is to ensure that an entity provides relevant information that faithfully represents insurance contracts. According to the standard, insurance liabilities shall be measured at the current fulfilment cash flows instead of historical costs. Furthermore, the objective is to form a uniform basis regarding the recognition, measurement and presentation of insurance contracts, including the notes. In the EU, the standard must be applied for financial years beginning on or after 1 January 2021; and has not yet been adopted by the EU. Deutsche Börse Group currently analyses the potential impact on the consolidated financial statements; at present, no material effects for the Group's financial position and financial performance are expected.

2. Consolidation principles

Intra-Group assets and liabilities are eliminated. Income arising from intra-Group transactions is eliminated against the corresponding expenses. Intercompany profits or losses arising from deliveries of intra-Group goods and services, as well as dividends distributed within the Group, are eliminated. Deferred taxes for consolidation adjustments are recognised where these are expected to reverse in subsequent years.

Interests in equity attributable to non-controlling interest shareholders are carried under “non-controlling interests” within equity. Where these are classified as “puttable instruments”, they are reported under “liabilities”.

Currency translation

Transactions denominated in a currency other than a company's functional currency are translated into the functional currency at the spot exchange rate applicable at the transaction date. At the reporting date, monetary balance sheet items in foreign currency are measured at the exchange rate at the reporting date, while non-monetary balance sheet items recognised at historical cost are measured at the exchange rate on the transaction date. Non-monetary balance sheet items measured at fair value are translated at the exchange rate prevailing at the valuation date. Exchange rate differences are recorded as other operating income or expenses in the period in which they arise unless the underlying transactions are hedged. Gains and losses from a monetary item that forms part of a net investment in a foreign operation are recognised directly in “retained earnings”.

The balance sheet items of companies whose functional currency is not the euro are translated into the reporting currency as follows: assets and liabilities are translated into euros at the closing rate, equity is translated at historical rates and the items in the consolidated income statement are translated at the average exchange rates for the reporting period. Resulting exchange differences are recognised directly in “retained earnings”. When the relevant subsidiary is sold, these exchange rate differences are recognised in the net profit for the period in which the deconsolidation gain or loss is realised.

The following euro exchange rates of consequence to Deutsche Börse Group were applied:

Exchange rates

		Average rate 2019	Average rate 2018	Closing price as at 31 Dec 2019	Closing price as at 31 Dec 2018
Swiss francs	CHF	1.1112	1.1512	1.0857	1.1264
US dollars	USD (US\$)	1.1195	1.1801	1.1212	1.1433
Czech koruna	CZK	25.6700	25.6605	25.4068	25.7315
Singapore dollar	SGD	1.5256	1.5907	1.5090	1.5577
British pound	GBP (£)	0.8767	0.8863	1.0857	0.8978

Any goodwill arising on the acquisition of a foreign operation and any fair value adjustments to the carrying amounts of assets and liabilities arising from initial consolidation are reported in the functional currency of the foreign operation and translated at the closing rate.

Subsidiaries and business combinations

Deutsche Börse AG and all subsidiaries directly or indirectly controlled by Deutsche Börse AG are included in the consolidated financial statements. Deutsche Börse AG controls a company if it is exposed to variable returns resulting from its involvement with the company in question or has rights to such returns and is able to influence them by using its power over the company.

Initial consolidation of subsidiaries in the course of business combinations uses the purchase method. The acquiree's identifiable assets, liabilities and contingent liabilities are recognised at their acquisition date fair values. Any excess of cost over the acquirer's interest in the fair value of the subsidiary's net identifiable assets is recognised as goodwill. Goodwill is reported in subsequent periods at cost less accumulated impairment losses.

Deutsche Börse AG's equity interests in subsidiaries, associates and joint ventures as at 31 December 2019 included in the consolidated financial statements are presented in the list of shareholdings in [note 34](#).

Acquisitions

Fondcenter AG, Zurich, Switzerland (Fondcenter)

On 21 January 2020, Deutsche Börse Group announced that the Group's post-trade services provider Clearstream and UBS have agreed on a partnership in the investment fund services business segment. The companies have entered into an agreement under which Clearstream Holding AG, Frankfurt, Germany will acquire 51 per cent of the fund distribution platform Fondcenter AG, Zurich, Switzerland from UBS for a purchase price of CHF389 million. UBS will retain a minority of 49 per cent. The newly-combined company will become the centre of excellence for fund distribution services within Deutsche Börse Group and will significantly enhance Clearstream's existing Fund Desk business (formerly Swisscanto Funds Centre). This will create a leading fund distribution service provider – to the benefit of UBS customers as well as Clearstream customers.

The transaction is expected to be closed in the second half of 2020. Following transaction closing, Deutsche Börse Group will exercise control over the Fondcenter business, and will therefore include the entity in its basis of consolidation. At the time of publication of this annual report, detailed information regarding the purchase price allocation are not yet available.

Axioma Inc, New York, USA (Axioma)

Deutsche Börse AG, Frankfurt/Main, Germany, completed the acquisition of Axioma Inc., New York, USA (Axioma) during the third quarter of 2019. Axioma was merged with Deutsche Börse's existing index businesses to form the Qontigo segment, which is an innovative provider of investment information and a leading developer of solutions for modernising investment management – from risk to return. Deutsche Börse has held a 78.3 per cent stake in the merged company since 13 September 2019.

As part of the transaction, General Atlantic, Greenwich, USA, acquired a share of 19.2 per cent in Deutsche Börse Group's combined index business. The share of General Atlantic will be disclosed as part of non-controlling interests in Deutsche Börse Group's income statement, statement of comprehensive income, and statement of financial position. Given the fact that Deutsche Börse AG retained control of the (previously existing) index business after the transaction, an amount of €417.9 million was recognised directly in shareholders' equity of Deutsche Börse Group (for further details, see [Consolidated statement of changes in equity](#)). Shareholders hold put options on the remaining 2.5 per cent stake in the index business not held by Deutsche Börse AG. Deutsche Börse Group applies the anticipated acquisition method to the shares held by third parties. This means that Deutsche Börse Group does not disclose such shares under non-controlling interests, but recognises financial liabilities in the amount of €84.0 million (part of the consideration transferred), which are measured at fair value through profit or loss.

Since the business models are highly complementary, Deutsche Börse expects the transaction to deliver considerable synergies both in terms of revenue and cost effects. Such synergies are reflected in particular by the goodwill resulting from the transaction. The purchase price allocation – preliminary as at the reporting date – yielded the following effects:

Goodwill resulting from the business combination with Axioma Inc.

	Preliminary goodwill calculation 13 Sep 2019 €m
Consideration transferred	
Purchase price in cash	648.3
Put options	84.0
Acquired bank balances	-1.9
Total consideration	730.3
Acquired assets and liabilities	
Customer relationships	36.3
Trade names	65.0
Software	90.3
Software in development	15.2
Other non-current assets	15.2
Other current assets (without cash)	41.5
Deferred tax liabilities	-36.8
Other non-current and current liabilities	-71.5
Contract liabilities	-21.5
Total assets and liabilities acquired	133.9
Goodwill (not tax-deductible)	596.4

The full consolidation of Axioma Inc. and its subsidiaries resulted in an increase of net revenue amounting to €25.8 million as well as a decrease of income after tax amounting to €5.0 million. If the company had been fully consolidated as at 1 January 2019, this would have resulted in an increase of net revenue amounting to €67.9 million as well as a decrease of income after tax amounting to €19.5 million.

Ausmaq Limited, Sydney, Australia (Ausmaq)

Clearstream Banking S.A., Luxembourg (Clearstream Banking Luxembourg) successfully completed the acquisition of Ausmaq Limited, Sydney, Australia, during the third quarter of 2019. With this acquisition, Deutsche Börse Group is further expanding its offering in the investment funds space, and has entered the Australian market. Ausmaq Limited has been a wholly-owned subsidiary of Clearstream Banking Luxembourg since 31 July 2019. Revenue and costs are reported in the IFS segment (Investment Fund Services). Due to the expansion of its geographical footprint, Deutsche Börse expects the transaction to deliver revenue synergies, reflected in particular by the resulting goodwill. The purchase price allocation – preliminary as at the reporting date – yielded the following effects:

Goodwill resulting from the business combination with Ausmaq Limited

	Preliminary goodwill calculation 31 Jul 2019 €m
Consideration transferred	
Purchase price in cash	24.3
Acquired bank balances	-7.5
Total consideration	16.8
Acquired assets and liabilities	
Customer relationships	4.5
Software	4.8
Other non-current assets	0.4
Other current assets less liabilities	-0.1
Deferred tax liabilities on temporary differences	-2.8
Total assets and liabilities acquired	6.8
Goodwill (not tax-deductible)	10.0

The full consolidation of Ausmaq Limited resulted in an increase of net revenue amounting to €3.3 million as well as of income after tax amounting to €0.3 million. If the company had been fully consolidated as at 1 January 2019, this would have resulted in an increase of net revenue amounting to €8.0 million as well as of income after tax amounting to €0.3 million.

Grexel Systems Oy, Helsinki, Finland, (Grexel Systems)

Effective 1 February 2019, European Energy Exchange AG (EEX), Leipzig, Germany (a 75 per cent subsidiary of Deutsche Börse AG), acquired 100 per cent of the shares in Grexel Systems Oy, Helsinki, Finland (Grexel Systems). Grexel Systems is the leading provider of registries for guarantees of origin and other energy certificates in Europe. Revenue and costs are reported in the EEX segment (Commodities). The goodwill resulting from the transaction mainly reflects expected cost synergies. The purchase price allocation – preliminary as at the reporting date – yielded the following effects:

Goodwill resulting from the business combination with Grexel Systems Oy

	Preliminary goodwill calculation 1 Feb 2019 €m
Consideration transferred	
Purchase price in cash	9.4
Non-controlling interests	-2.3
Acquired bank balances	-1.2
Total consideration	5.9
Acquired assets and liabilities	
Customer relationships	3.2
Trade names	0.4
Software and other intangible assets	1.5
Other non-current assets	0.5
Current liabilities	-0.2
Deferred tax liabilities on temporary differences	-1.0
Non-controlling interests	-1.4
Total assets and liabilities acquired	3.0
Goodwill (not tax-deductible)	2.9

The full consolidation of Grexel Systems resulted in an increase of net revenue amounting to €1.8 million as well as of income after tax amounting to €0.1 million. If the company had been fully consolidated as at 1 January 2019, this would have resulted in an increase of net revenue amounting to €2.0 million as well as of income after tax amounting to €0.2 million.

Associates

Investments in associates and joint ventures are measured at cost on initial recognition and accounted for using the equity method upon subsequent measurement. Where Deutsche Börse Group's share of the voting rights in a company amounts to less than 20 per cent, Deutsche Börse Group's significant influence is exercised through the Group's representation on the supervisory board or the board of directors.

3. First-time adoption of IFRS 16 "Leases"

IFRS 16 establishes principles for the recognition, measurement, presentation and disclosure of leases. The objective of IFRS 16 is to ensure that lessees and lessors provide relevant information on the effects of lease contracts. The standard must be applied for financial years beginning on or after 1 January 2019.

Deutsche Börse Group initially applies IFRS 16 "Leases" using the modified retrospective approach. In line with the applicable transition regulations, comparative figures were not adjusted; therefore,

previous-year figures are not comparable. The changes in accounting policies resulting from the first-time adoption of IFRS 16 are set out below.

Lessee

As a lessee, Deutsche Börse Group uses office properties, data centres, and company cars. IFRS 16 introduces a single lessee accounting model. According to this approach, the lessee is obliged to recognise all leases: first, the lessee recognises the right-of-use asset, i.e. the lessee's right to use the leased asset; second, the lessee recognises the lease liability, i.e. the lessee's obligation to make lease payments.

Regarding leases with early termination or renewal options, Deutsche Börse Group exercises prudent commercial judgement to assess the applicable contract terms. Any and all significant facts and circumstances are taken into account in the assessment as to whether the exercising of early termination or renewal options is reasonably certain.

Deutsche Börse Group uses general practical expedients provided by IFRS 16 by not recognising right-of-use assets and lease liabilities for short-term leases (lease terms of less than twelve months) and low-value assets.

Measurement of lease liabilities:

Lease liabilities are recognised at the present value of future lease payments. The incremental borrowing rate of the Group at the beginning of the lease is used to calculate the present value. Value-added tax included in lease payments is neither considered in the lease liability nor in the carrying amount of the right-of-use asset, regardless of whether Deutsche Börse Group is entitled to make tax withholding or not.

In subsequent periods, interest payments made are recognised as increases of the lease liability, while lease payments are recognised as decreases. The Group remeasures its lease liabilities if adjustments to future lease payments are made.

Measurement of right-of-use assets:

Right-of-use assets are measured at cost. Any accumulated depreciation/amortisation and impairment amounts are deducted from the cost of right-of-use assets as part of subsequent measurement.

At first-time adoption, IFRS 16 was applied as follows:

- The present value of the lease liabilities is calculated on the basis of the future lease payments using the incremental borrowing rate. A uniform rate is selected for similar leases.
- The measurement of the right-of-use asset is calculated on the basis of the individual agreements, either retrospectively using the interest rate applied upon initial application or on the basis of the adjusted lease liabilities. The cumulative effects from first-time adoption of the new standard are recorded as at the date of first-time adoption directly in equity. The right-of-use asset is adjusted by provisions from the charges of lease agreements.
- In the case of agreements with a remaining term of less than twelve months at the date of first-time adoption, a decision is made on an individual agreement level.
- All arrangements identified as leases in the past will continue to be classified as such.
- Initial direct costs are not taken into account in the right-of-use asset.

Effects from the initial application of IFRS 16 “Leases”

Lessee

As a result of the recognition of right-of-use assets and the corresponding lease liabilities, Deutsche Börse Group's total assets increased by €265.6 million at initial application of IFRS 16. The effects recognised in equity (accumulated profit) amounted to €10.8 million (€8.0 million after deferred taxes). As at 1 January 2019, the following reconciliation of lease liabilities applies:

Reconciliation Leasing¹⁾

	€m
Operating lease commitment at 31 December 2018	310.9 ²⁾
Short-term Leases	2.0
Variable Lease Payments	5.3
Less other adjustments	15.2
Lease liabilities recognised at 01.01.2019 (gross amount)	288.4
Discounting	10.3
Lease liabilities due to first time application of IFRS 16 as of 01.01.2019	278.1

1) Comparative figures for the half year report 2019 were adjusted retrospectively

2) Prior year figures adjusted

The weighted incremental borrowing rate for the lease liabilities initially recognised as at 1 January 2019 was 0.8 per cent p.a.

As from 1 January 2019, the type of expenses associated with such leases changed as well. Since that date, Deutsche Börse Group has recognised depreciation for right-of-use assets as well as interest expenses from lease liabilities, instead of rental and lease expenses recognised in other operating expenses. These changes led to an improvement of earnings before interest, tax, depreciation and amortisation (EBITDA).

Consolidated income statement disclosures

4. Net revenue

Recognition of income and expenses

Overall, Deutsche Börse Group's net revenue comprised the following items:

- revenue,
- net interest income from banking business,
- other operating income, and
- volume-related costs.

Revenue recognition

This section comprises details on revenue from contracts with customers. This includes in particular: revenue recognition, trade receivables as well as contract liabilities (see [note 19](#) concerning net contractual liabilities). Revenue is generated in Deutsche Börse Group's segments as follows:

Eurex (financial derivatives)

Revenue in the derivatives business is generated primarily from fees that are charged for transactions with regard to the matching/registration, administration and regulation of order book and off-book transactions on Eurex Germany. Fees, as well as any reductions are specified in price lists and circulars. Rebates depend mainly on monthly volumes or the monthly fulfilment of liquidity provisioning obligations in certain products or product groups. Revenue for transactions in listed derivatives is recognised as soon as contracts are matched/registered and there is no unfulfilled obligation towards the customer. Receivables are recognised if the agreed service is rendered at a specific point in time and the claim to the consideration solely depends on the course of time. Transaction fees are invoiced on a monthly basis and are payable when invoiced. Since discounts are generally granted on a monthly basis, the recognition of a contractual liability is not necessary. Payments are generally debited directly from the clearing member immediately after invoicing.

Fees are also collected for clearing and settlement services provided for off-exchange (over-the-counter, OTC) transactions, mainly comprising posting and administration fees. Fees for these transactions and the related discounts are also specified in price lists and circulars of Eurex Clearing AG. In the case of OTC transactions, posting fees are recognised at novation on a monthly basis. These fees are recognised at a specific point in time; namely, when the promised service is transferred at a specific point in time, and the entitlement to consideration depends solely on the passage of time. OTC administrative fees are recognised based on a time period as the service is provided until the transaction has been closed, terminated or has matured. A receivable is recognised monthly based on the usage within the respective month, provided that the respective position is still open at month end. In general, the payments are directly debited from the clearing member.

In addition connection fees are charged for the technical connections to the trading and clearing systems of Deutsche Börse Group. The customer has use of the company's service and uses the service as it is performed over the life of the contract. As the smallest reporting period is the same as the contract term, the performance progress equals 100 per cent. The connectivity revenue generated from this is usually realised monthly with invoicing.

EEX (commodities)

Its product portfolio comprises contracts on power, natural gas and emission allowances, as well as freight rates and agricultural products. Revenue is generated primarily from fees that are charged for exchange trading and clearing of commodity products. Transaction fees are specified in the price list. Rebates are granted primarily in the form of monthly rebates for the provision of a certain volume or level of liquidity. These types of rebates are dependent upon the total monthly volume or the monthly fulfilment of certain liquidity provision obligations. Revenue is recognised as soon as contracts are matched/registered and there is no unfulfilled obligation towards the customer as the service has already been performed by this point in time. EEX recognises receivables when the promised service is provided at a certain time and the entitlement to consideration depends solely on the passage of time. Most of the invoiced amounts are debited directly from the clearing members.

360T (foreign exchange)

360T is a provider of optimised services covering the entire trading process of foreign-exchange products. It generates commission income from transaction and access fees payable for the use of its trading platform. In addition, 360T generates installation fees from the onboarding of customers on its trading platform, as well as user set-up fees and fees for the programming and maintenance of necessary interfaces. Revenue is recognised when the contractually agreed service is provided to the customer. Revenue from the use of the platform and maintenance fees are recognised on a pro-rata basis. Access fees, transaction fees, as well as trading platform fees, contain different discount schedules on a monthly basis. Such discounts are considered accordingly in the month in which the services are rendered and reduce the sales revenue of such period. They are invoiced on a monthly basis. Maintenance fees are invoiced on an annual basis.

Xetra (cash equities)

As a general rule, securities intended for trading on the regulated market of Frankfurter Wertpapierbörse (FWB, the Frankfurt Stock Exchange) are subject to the admission and listing, or inclusion, resolved by FWB's Exchange Management. Deutsche Börse AG, as the operator of the public-sector exchange, charges fees for the admission, listing, inclusion and quotation of securities on the regulated market. Fees charged for the admission and inclusion of securities with definite maturities on the regulated market are realised using the projected useful lives of the underlying securities. Accordingly, the fees charged for the listing of securities on the regulated unofficial market are realised using the projected useful lives of the underlying securities. The method for measuring progress towards complete satisfaction of the performance obligation on the basis of projected useful lives is considered appropriate within the meaning of IFRS 15. Invoicing is made on a quarterly basis, and receivables are payable upon receipt of invoice.

Listing fees are levied for the activity of all bodies of FWB, which supervise the trading and the settlement of trades as well as ensure the proper functioning of all trading activities (permanent possibility to make use of exchange facilities). Listing fees are recurring fees, which are charged for a service that is delivered over time. Accordingly, revenue is realised on a pro-rata basis. Revenue from fees for listings on the regulated unofficial market is realised in a similar manner. For trading cash market products, the same accounting treatment as described within the [section Eurex \(financial derivatives\)](#) applies for the Xetra segment (securities trading).

Clearstream (post-trading)

Clearstream provides post-trading infrastructure and services; it offers transaction settlement services as well as administration and custody of securities. The fees are calculated in accordance with the prices set in the price list as well as with any relevant discounts granted. In accordance with the general terms and conditions, the customer authorises direct debiting and consequently no financing component has been identified. Customers in the custody business receive the benefit from the service provided and consume it at the same time as the performance is fulfilled during the contract period. The revenue generated from this is generally realised on a monthly basis upon invoicing.

Fees collected for the administration of securities and for settlement services are recognised when the agreed service is provided to the customer. This occurs when instructions are received and the transactions are processed. The service has been fulfilled at this point in time. Receivables are recognised if the agreed service is rendered at a specific point in time and the claim to the consideration solely depends on the course of time. Since discounts are generally granted on a monthly basis, the recognition of a contractual liability is not necessary. Customers are invoiced on a monthly basis and consideration is payable when invoiced.

IFS (investment fund services)

The segment provides services to standardise fund processing and to increase efficiency and safety in the investment fund sector. The services offered comprise order routing, settlement and asset administration, as well as custody services. Revenue is recognised when the promised service is transferred to the customer. This occurs when instructions are received and the transactions are processed. The service has been fulfilled at this point in time. Revenue is recognised based on the price specified in the price list and reduced by the corresponding rebates. Customers are invoiced on a monthly basis and consideration is payable when invoiced.

GSF (collateral management)

Via Clearstream, Deutsche Börse Group provides a comprehensive range of global securities financing (GSF) services with the two most prominent being collateral management and securities lending services. Customers of collateral management services simultaneously receive and consume the benefits with the company's performance of the service. Revenue is recognised over a certain period of time concurrent with the provision of collateral management services. Services in the securities lending business, on the other hand, are provided at a specific point in time.

Qontigo (index and analytics business)

The Qontigo segment comprises the index and analytics business. The index offering ranges from blue-chip to benchmark to strategy to sustainability to smart-beta indices. The Group generates revenue from calculating and marketing indices, which financial market participants use as underlyings for financial instruments or as a benchmark for the performance of investment funds. In Analytics, Qontigo offers its clients risk-analytics and portfolio-construction tools.

Customers in the index business simultaneously receive and consume all of the benefits provided during the contract term. The recognition of revenue for index licences is based on fixed payments, variable payments (usage-based volumes; mostly assets under management), or a combination of the two. For variable payments, customers report their usage, and fees are invoiced in the quarter after usage; monthly estimates are recognised. This is determined either based on the customer's average usage over the previous twelve months, adjusted to take into account current developments in the markets, or based on the real data in the markets on a customer level. Revenue estimates are revised when warranted by the circumstances. Increases and decreases in estimated revenue are reflected in the consolidated income statement in the period in which the circumstances that give rise to the revision become known by the management. For two fee components (minimum fee and usage-based fee), a contract liability is recognised and reduced each month based on the usage that has been recognised each month. Customers are invoiced on a quarterly basis, and consideration is payable when invoiced.

Customers of the analytics business either receive the right to access the intellectual property, or receive the right to use the intellectual property. The intellectual property licences are granted for software products, which are subsequently referred to as "SaaS Front Office" and "SaaS Middle Office". Revenue generated with SaaS Front Office fees is recognised at a specific point in time because all contractual obligations are fulfilled, and the customer obtains control of the asset, as soon as the licence key is transferred to the customer. SaaS Middle Office fees are recognised over a certain period of time, i.e. the contractual term. Fees are also charged for the maintenance and servicing (summarized as "Maintenance") of the software products, which are realized over the contract term. For this purpose, the transaction price for maintenance is calculated and allocated according to the "expected cost plus a margin" approach.

Data (data business)

Market participants subscribe to real-time trading and market signals or licence these services for their own use, processing, or dissemination. The customer simultaneously receives and consumes the benefits provided by the entity's performance during the contract term. Customers report their usage, and fees are charged in the month after usage. Deutsche Börse Group puts together monthly estimates that are based on the trend of the preceding months. Revenue estimates are revised when warranted by the circumstances. Increases and decreases in estimated revenue are reflected in the consolidated income statement in the period in which the circumstances that give rise to the revision become known by the management. Revenue is recognised based on the price specified in the price list. Customers are invoiced on a monthly basis, and consideration is payable when invoiced.

Net interest income from banking business

Net interest income from banking business mainly results from interest income, generated by investing excess cash (in a positive interest rate environment). Given the currently prevailing interest rate anomaly, Deutsche Börse Group also generates interest income from customer balances held at Deutsche Börse Group (in a negative interest rate environment). Furthermore, this item comprises interest payments made on customer balances (positive interest rate environment) as well as cash investments (negative interest rate environment) and fees for providing customer credit lines. Interest income and interest expenses are calculated, allocated, and realised when due, with the applicable effective interest rate on a daily basis.

Other operating income

Other operating income is income not attributable to the typical business model of Deutsche Börse Group; it is therefore not disclosed as part of revenue. Other operating income is usually realised when all chances and risks have been transferred. Other operating income comprises, for instance, income from subleasing property, income from exchange rate differences as well as the reversal of impairments recognised on trade receivables.

Volume-related costs

The “volume-related costs” item comprises expenses that depend, in particular, on the number of certain trade or settlement transactions, the custody volume, the Global Securities Financing volume, or the volume of market data acquired or that result from revenue-sharing agreements or maker-taker pricing models. Volume-related costs are not incurred if the corresponding revenue is no longer generated.

Composition of net revenue (part 1)

	Sales revenue		Net interest income from banking business	
	2019 €m	2018 €m	2019 €m	2018 €m
Xetra (cash equities)				
Trading and clearing	169.7	187.6	0	0
Listing	19.3	17.5	0	0
Other	46.3	40.3	0	0
	235.3	245.4	0	0
Eurex (financial derivatives)				
Equity index derivatives	534.6	514.2	0	0
Interest rate derivatives	214.0	233.6	0	0
Equity derivatives	58.4	49.8	0	0
OTC clearing	41.8	23.6	0	0
Margin fees	17.0	13.4	46.3	40.2
Infrastructure	76.7	74.2	0	0
Other	30.2	26.8	0	-0.1
	972.7	935.6	46.3	40.1
EEX (commodities)				
Power derivatives	113.3	88.2	7.7	5.9
Power spot	72.6	67.3	0	0
Gas	55.1	44.9	0	0
Other	67.0	71.0	3.7	3.0
	308.0	271.4	11.4	8.9
360T (foreign exchange)				
Trading	82.8	70.1	0	0
Other ¹⁾	15.1	11.9	0	0
	97.9	82.0	0	0

	Other operating income		Volume-related costs		Net revenue	
	2019 €m	2018 €m	2019 €m	2018 €m	2019 €m	2018 €m
	5.7	5.3	-19.0	-22.3	156.4	170.6
	1.5	0.8	-0.9	-0.5	19.9	17.8
	0	0	0	0	46.3	40.3
	7.2	6.1	-19.9	-22.8	222.6	228.7
	0.2	0.1	-50.8	-48.1	484.0	466.2
	0.1	0.1	-3.2	-1.8	210.9	231.9
	0.1	0	-7.4	-6.0	51.1	43.8
	11.7	3.6	-12.3	-1.6	41.2	25.6
	-11.0	-3.6	0	0	52.3	50.0
	0	0	-0.2	0	76.5	74.2
	15.1	21.4	-4.2	-3.7	41.1	44.4
	16.2	21.6	-78.1	-61.2	957.1	936.1
	0	0	-15.9	-12.0	105.1	82.1
	0	0	-1.7	-0.2	70.9	67.1
	0	0	-12.3	-8.3	42.8	36.6
	1.3	1.3	-1.5	-4.5	70.5	70.8
	1.3	1.3	-31.4	-25.0	289.3	256.6
	0	0	-5.9	-3.4	76.9	66.7
	0.1	0.2	0	0	15.2	12.1
	0.1	0.2	-5.9	-3.4	92.1	78.8

Composition of net revenue (part 2)

	Sales revenue		Net interest income from banking business	
	2019 €m	2018 €m	2019 €m	2018 €m
Clearstream (post-trading)				
Custody	532.3	514.9	0	0
Settlement	130.7	113.2	0	0
Net interest income from banking business	0	0	188.2	155.5
Third-party services	24.6	32.5	0	0
Other	104.9	97.4	0	0
	792.5	758.0	188.2	155.5
GSF (collateral management)				
Repo	49.9	44.2	0	0
Securities lending	62.5	91.8	0	0
	112.4	136.0	0	0
IFS (investment fund services)				
Custody	80.0	68.5	0	0
Settlement	58.6	52.6	0	0
Other	56.1	41.2	0.2	0
	194.7	162.3	0.2	0
Data				
Cash and derivatives	126.0	127.8	0	0
Regulatory services	22.2	19.8	0	0
Other ²⁾	48.9	49.7	0	0
	197.1	197.3	0	0
Qontigo (index and analytics business)				
ETF licenses	43.0	47.3	0	0
Exchange licenses	34.4	34.2	0	0
Axioma	27.4	0	0	0
Other licenses ²⁾	101.9	89.9	0	0
	206.7	171.4	0	0
Total	3,117.3	2,959.4	246.1	204.5
Consolidation of internal revenue	-63.1	-60.2	0	0
Group	3,054.2	2,899.2	246.1	204.5

	Other operating income		Volume-related costs		Net revenue	
	2019 €m	2018 €m	2019 €m	2018 €m	2019 €m	2018 €m
	0.2	1.7	-140.8	-133.8	391.7	382.8
	0	0	-48.5	-37.2	82.2	76.0
	0	0	0	0	188.2	155.5
	0	0	-0.3	-0.4	24.3	32.1
	3.0	11.1	-29.6	-27.6	78.3	80.9
	3.2	12.8	-219.2	-199.0	764.7	727.3
	0	0	-1.0	-0.9	48.9	43.3
	0	0	-33.4	-52.0	29.1	39.8
	0	0	-34.4	-52.9	78.0	83.1
	0	0	-3.3	-2.6	76.7	65.9
	0	0	-5.0	-3.2	53.6	49.4
	-0.1	0	-3.4	-2.2	52.8	39.0
	-0.1	0	-11.7	-8.0	183.1	154.3
	0	0	-14.0	-14.2	112.0	113.6
	0	0	-3.1	-2.0	19.1	17.8
	0.5	0.4	-21.6	-24.0	27.8	26.1
	0.5	0.4	-38.7	-40.2	158.9	157.5
	0	0	-4.3	-3.5	38.7	43.8
	0	0	-2.9	-2.9	31.5	31.3
	0.1	0	-1.7	0	25.8	0
	0.3	0.1	-8.0	-7.8	94.2	82.2
	0.4	0.1	-16.9	-14.2	190.2	157.3
	28.8	42.5	-456.2	-426.7	2,936.0	2,779.7
	-13.7	-13.8	76.8	74.0	0	0
	15.1	28.7	-379.4	-352.7	2,936.0	2,779.7

1) As part of the harmonisation of the reporting of connectivity and maintenance fees, €5.3 million were reclassified from other operating income to sales revenues
 2) As part of the combination, certain licence revenues were re-allocated from the Data segment to the new Qontigo segment (index and analytics business)

Composition of net interest income from banking business

	2019 €m	2018 €m
Interest income from positive interest environment	270.1	216.3
Debt financial assets measured at amortised cost	207.7	161.6
Financial assets at FVPL	62.4	54.7
Interest expenses from positive interest environment	-85.8	-64.9
Financial liabilities measured at amortised cost	-71.7	-53.4
Financial liabilities at FVPL	-14.1	-11.5
Interest income from negative interest environment	250.7	224.7
Financial liabilities measured at amortised cost	242.6	219.5
Financial liabilities at FVPL	8.1	5.2
Interest expenses from negative interest environment	-188.9	-171.6
Debt financial assets measured at amortised cost	-186.8	-169.9
Financial assets at FVPL	-2.1	-1.7
Total	246.1	204.5

Other operating income

Other operating income in the amount of €15.1 million (2018: €28.7 million) mainly comprises rental income from subleases (income from operating leases) in amount of €1.0 million (2018: €1.1 million) and income from exchange rate in amount of €4.6 million (2018: €4.6 million).

5. Staff costs

Composition of staff costs

	2019 €m	2018 €m
Wages and salaries	622.1	660.1
Social security contributions, retirement and other benefits	125.7	163.9
Total	747.8	824.0

Wages and salaries comprise costs associated with the efficiency programme in the amount of €42.1 million (2018: €158.2 million).

6. Other operating expenses

Composition of other operating expenses

	2019 €m	2018 €m
Costs for IT service providers and other consulting services	226.4	164.9
IT costs	125.4	123.0
Non-recoverable input tax	37.8	44.3
Premises expenses	32.3	80.0
Travel, entertainment and corporate hospitality expenses	24.6	22.7
Advertising and marketing costs	21.9	22.6
Insurance premiums, contributions and fees	13.3	15.8
Voluntary social benefits	6.4	5.6
Cost of exchange rate differences	5.7	5.2
Supervisory Board remuneration	4.1	4.5
Short-term leases	2.0	-
Cost of agency agreements	0.3	0.3
Miscellaneous	16.4	27.3
Total	516.6	516.2

Composition of fees paid to the auditor

	2019		2018	
	Total €m	Germany €m	Total €m	Germany €m
Statutory audit services	4.5 ¹⁾	2.6	4.3 ²⁾	2.6
Other assurance or valuation services ³⁾	0.4	0.1	1.2 ⁴⁾	0.8
Tax advisory services	0.5	0.3	0.3	0.2
Other services	0.2	0.1	0	0
Total	5.6	3.1	5.8	3.6

1) Thereof €0.2 million for 2018

2) Thereof €0.1 million for 2017

3) Service according to ISAE 3402 and ISAE 3000

4) Thereof €0.2 million for 2017

Fees paid for “statutory audit services” rendered by KPMG AG Wirtschaftsprüfungsgesellschaft mainly comprise the audit of the consolidated financial statements according to IFRS, of the annual financial statements of Deutsche Börse AG according to the Handelsgesetzbuch (HGB, German Commercial Code) and of the annual financial statements of various subsidiaries according to the respective local GAAP. This item also includes statutory additions to the audit scope as well as key points of audit agreed with the Supervisory Board. Services rendered during the reporting year also included reviews of the interim financial statements.

7. Research and development costs

Research and development costs of internally developed software

Research costs are expensed in the period in which they are incurred. Development costs for internally developed intangible assets are only capitalised when the definition and recognition criteria for intangible assets according to IAS 38 are met, and development costs can be separated from research costs.

Development costs that have to be capitalised include direct labour costs, costs of purchased services and workplace costs, including proportionate overheads that can be directly attributed to the preparation of the respective asset for use, such as costs for the software development environment. Development costs that do not meet the requirements for capitalisation are recognised through profit or loss. Interest expense that cannot be allocated directly to one of the development projects is recognised through profit or loss in the reporting period.

Research and development costs

	Total expense for software development		of which capitalised	
	2019 €m	2018 €m	2019 €m	2018 €m
Eurex (financial derivatives)	36.7	35.9	20.7	20.4
EEX (commodities)	24.9	12.9	10.2	9.2
360T (foreign exchange)	4.9	3.9	3.9	3.0
Xetra (cash equities)	6.7	4.9	3.9	2.7
Clearstream (post-trading)	41.3	43.1	36.3	35.7
IFS (investment fund services)	11.0	6.3	9.2	4.4
GSF (collateral management)	4.3	1.5	3.4	1.0
Qontigo (index and analytics business)	5.0	3.0	5.0	0
Data (data business)	7.0	16.9	4.9	3.8
Research expense	0.3	2.4	0	0
Total	142.2	130.8	97.5	80.2

8. Net income from strategic investments

Composition of net income from strategic investments

	2019 €m	2018 €m
Equity method-accounted result of associates		
China Europe International Exchange AG	-1.7	-2.0
HQLAx S.à r.l.	-1.5	-0.5
Tradegate AG Wertpapierhandelsbank	2.9	4.9
Other	0.4	0.3
Total income from equity method measurement¹⁾	0.2	2.7
Net income from other strategic investments	6.5	1.5
Total	6.7	4.2

1) Including impairment losses

In addition to the result of at-equity valuation the net income from associates also includes impairment losses. No impairment loss was recognised in the reporting year (2018: €0.6 million for the participation in Switex GmbH).

Dividends are recognised in net income from other strategic investments if the right to receive payment is based on legally assertible claims. In the year under review, Deutsche Börse Group received dividends in the amount of €1.3 million (2018: €2.9 million).

For the development of net income from other strategic investments, please refer to [note 13.1](#).

9. Financial result

The financial result comprises interest income and expenses which are not attributable to the banking business of Deutsche Börse Group, and are therefore not recognised in net revenue. Interest income and expense are recognised using the effective interest method over the respective financial instrument's term to maturity. Interest income is recognised when it is probable that the economic benefits associated with the transaction will flow to the entity and the income can be measured reliably. Interest expense is recognised in the period in which it is incurred.

Composition of financial income

	2019 €m	2018 €m
Income from other financial assets FVPL	0.3	0.3
Interest income from financial assets measured at amortised cost	1.3	1.0
Interest income on tax refunds	7.0	6.0
Other interest income and similar income	2.1	0.1
Total	10.7	7.4

Composition of financial expense

	2019 €m	2018 €m
Interest expense from financial liabilities measured at amortised cost	48.2	47.5
Interest expense on taxes	3.1	26.7
Interest expense from financial assets measured at amortised cost	2.8	3.1
Expense of the unwinding of the discount on pension provisions	2.8	2.5
Transaction cost of financial liabilities measured at amortised cost	2.2	1.8
Other interest expense	0.2	1.4
Expense from derivatives	0	0.7
Expense from other financial liabilities FVPL	0	0.1
Interest expense on lease liabilities	5.2	–
Total	64.4	83.8

10. Income tax expense

Deutsche Börse Group is subject to the tax laws of those countries in which it operates and generates income. If it is probable that the tax authorities will not accept the disclosed amounts or the legal assessments on which the Group's tax declarations are based (uncertain tax positions), tax liabilities are recognised based on the best possible estimate of expected cash outflows. Tax assets are recognised if it is considered likely that they will be realised. The recognition of uncertain tax positions is reassessed if there is a change in the underlying facts or their legal assessment (e.g. change in case law).

Deferred tax assets and liabilities are computed using the balance sheet liability approach. The deferred tax calculation is based on temporary differences between the carrying amounts of assets and liabilities in the IFRS financial statements and their tax base that will lead to a future tax liability or benefit when assets are used or sold or liabilities are settled. These differences are used to calculate deferred tax assets or liabilities.

The deferred tax assets or liabilities are measured using the tax rates that are currently expected to apply when the temporary differences reverse, based on tax rates that have been enacted or substantively enacted by the reporting date. Deferred tax assets are recognised for the unused tax loss carryforwards only to the extent that it is probable that future taxable profit will be available. Deferred tax assets and deferred tax liabilities are offset where a legally enforceable right to set off current tax assets against current tax liabilities exists, and the deferred tax assets and deferred tax liabilities relate to income taxes levied by the same taxation authority.

Composition of income tax expense

	2019 €m	2018 €m
Current income tax expense/(income)	378.0	339.7
for the current year	384.4	320.5
for previous years	-6.4	19.2
Deferred income tax expense/(income)	-15.4	-36.0
due to temporary differences	-22.7	-12.0
due to tax loss carryforwards	-0.4	-1.6
due to changes in tax legislation and/or tax rates	7.7	-22.4
Total	362.6	303.7

Allocation of income tax expense to Germany and foreign jurisdictions

	2019 €m	2018 €m
Current income tax expense	378.0	339.7
Germany	245.4	237.7
Foreign jurisdictions	132.6	102.0
Deferred income tax expense/(income)	-15.4	-36.0
Germany	-6.4	-5.9
Foreign jurisdictions	-9.0	-30.1
Total	362.6	303.7

Tax rates of 27.4 to 31.9 per cent (2018: 27.4 to 31.9 per cent) were used in the reporting period to calculate income taxes for the German Group companies. These reflect trade income tax at rates of 11.6 to 16.1 per cent (2018: 11.6 to 16.1 per cent), corporation tax of 15 per cent (2018: 15 per cent) and the 5.5 per cent solidarity surcharge (2018: 5.5 per cent) on corporation tax.

A tax rate of 24.9 per cent (2018: 26.0 per cent) was used for the Luxembourgian Group companies, reflecting trade income tax at a rate of 6.7 per cent (2018: 6.7 per cent) and corporation tax at 18.2 per cent (2018: 19.3 per cent).

Tax rates of 10.0 to 34.6 per cent (2018: 10.0 to 34.6 per cent) were applied to the Group companies in the remaining countries; see [note 34](#).

In the year under review, Deutsche Börse Group did not utilise any previously unrecognised tax loss carryforwards (2018: nil). There was no deferred tax income from previously unrecognised tax losses (2018: €0.7 million). As in the previous year, there were no effects resulting from changes of the impairment of deductible temporary differences.

The following table shows the carrying amounts of deferred tax assets and liabilities as at the reporting date by line item or loss carryforward:

Composition of deferred taxes

	Deferred tax assets		Deferred tax liabilities	
	31 Dec 2019 €m	31 Dec 2018 €m	31 Dec 2019 €m	31 Dec 2018 €m
Intangible assets	63.8	50.3	-265.8	-210.9
Internally developed Software	47.4	43.0	-59.0	-31.8
Other	16.4	7.3	-206.8	-179.1
Financial assets	1.2	0.3	-5.2	-2.3
Other assets	3.1	3.7	-8.4	-2.4
Provisions for pensions and other employee benefits	78.6	61.4	-15.1	-8.7
Other provisions	14.7	13.9	-0.1	-0.1
Liabilities	18.3	3.8	-2.9	-2.0
Tax loss carryforwards	15.9	2.8	0	0
Deferred taxes (before netting)	195.6	136.2	-297.5	-226.4
thereof recognised in profit and loss	135.4	87.3	-295.6	-224.5
thereof recognised in other comprehensive income ¹⁾	60.2	48.9	-1.9	-1.9
Netting of deferred taxes	-71.2	-31.9	71.2	31.9
Total	124.4	104.3	-226.3	-194.5

1) See [note 15](#) for further information on deferred taxes recognised in other comprehensive income

Short-term elements of deferred taxes are recognised in non-current assets and liabilities, in line with IAS 1 “Presentation of Financial Statements”.

At the end of the reporting period, accumulated unused tax losses amounted to €39.5 million (2018: €30.5 million), for which no deferred tax assets were recognised. The unused tax losses are attributable to domestic losses totalling €4.6 million and to foreign tax losses totalling €34.9 million (2018: domestic tax losses €0.2 million, foreign tax losses €30.3 million).

The losses can be carried forward indefinitely in Germany subject to the minimum taxation rules. In the US, losses may be carried forward for a maximum period of 20 years, provided they were incurred before 1 January 2018. In accordance with the latest tax reform in the US, adopted at the end of December 2017, losses incurred after 31 December 2017 may be carried forward indefinitely, taking into account newly introduced minimum taxation rules. In all other countries, losses can be carried forward indefinitely.

There were no unrecognised deferred tax liabilities on future dividends of subsidiaries and associates or on gains from the disposal of subsidiaries and associates in the reporting period (2018: nil).

Reconciliation from expected to reported tax expense

	2019 €m	2018 €m
Earnings before tax (EBT)	1,398.4	1,156.8
Expected tax expense	363.6	312.3
Effects of different tax rates	-12.3	-20.5
Effects of non-deductible expenses	10.4	13.1
Effects of tax-exempt income	-11.8	-9.4
Tax effects from loss carryforwards	0.3	1.0
Effects from changes in tax rates	7.7	-5.1
Effects from intra-group restructuring	-5.0	-10.9
Other	16.1	4.0
Income tax expense arising from current year	369.0	284.5
Income taxes for previous years	-6.4	19.2
Income tax expense	362.6	303.7

To determine the expected tax expense, earnings before tax have been multiplied by the composite tax rate of 26 per cent assumed for 2019 (2018: 27 per cent).

As at 31 December 2019, the reported tax rate was 25.9 per cent (2018: 26.3 per cent).

Consolidated balance sheet disclosures

11. Intangible assets

Recognition and Measurement

Capitalised development costs are amortised from the date of first use of the software using the straight-line method over the asset's expected useful life. The useful life of internally developed software is generally assumed to be five years; a useful life of seven years is used as the basis in the case of newly developed trading platforms and clearing or settlement systems, and for certain enhancements of these systems.

Purchased software is generally amortised based on the projected useful life. The amortisation period for intangible assets with finite useful lives is reviewed at a minimum at the end of each financial year. If the expected useful life of an asset differs from previous estimates, the amortisation period is adjusted accordingly.

The other intangible assets were largely acquired within the context of business combinations and refer to exchange licences, trade names and customer relationships. The acquisition costs correspond to the fair values as at the acquisition date. Depending on the relevant acquisition transaction, the expected useful life is 5 years for trade names with finite useful lives, 4 to 24 years for participant and customer relationships, and 2 to 20 years for other intangible assets.

Exchange licences as well as certain trade names have no finite useful lives, and, in addition, there is an intention to maintain the exchange licences as part of the general business strategy; therefore, an indefinite useful life is assumed.

Intangible assets are derecognised on disposal or when no further economic benefits are expected to flow from them.

Impairment tests

At each reporting date, the Group assesses whether there are any indications that an intangible asset may be impaired. If this is the case, the carrying amount is compared with the recoverable amount (the higher of value in use and fair value less costs of disposal) to determine the amount of any potential impairment.

Value in use is estimated on the basis of the discounted estimated future cash flows from continuing use of the asset and from its ultimate disposal, before taxes. For this purpose, discount rates are estimated based on the prevailing pre-tax weighted average cost of capital. If no recoverable amount can be determined for an asset, the recoverable amount of the cash-generating unit (CGU) to which the asset can be allocated is determined.

Irrespective of any indications of impairment, intangible assets with indefinite useful lives and intangible assets not yet available for use must be tested for impairment at least once a year. Impairment tests for

(group of) CGUs with allocated goodwill are carried out on 30 September every financial year. If the estimated recoverable amount of the asset or CGU is lower than the respective carrying amount, an impairment loss is recognised and the net carrying amount of the asset or CGU, respectively, is reduced to its estimated recoverable amount.

At the acquisition date, goodwill is allocated to the CGU, or groups of CGUs, that is/are expected to create synergies from the relevant acquisition. If changes arise in the structure of CGUs, for example through a new segmentation, goodwill is allocated taking into account the relative fair values of the newly defined CGUs. Irrespective of any indications of impairment, these items must be tested for impairment at least annually at the lowest level of impairment at which Deutsche Börse Group monitors the respective goodwill. An impairment loss is recognised if the carrying amount of the CGU, or groups of CGUs, to which goodwill is allocated (including the carrying amount of that goodwill) is higher than the recoverable amount of this group of assets. The impairment loss is first allocated to the goodwill, then to the other assets in proportion to their carrying amounts.

The recoverable amount of the (groups of) CGUs was determined based on the fair value less costs to sell. Only if the fair value less costs to sell did not exceed the carrying amount, the value in use was determined. Given that no active market was available for the (groups of) CGUs, the determination of fair values less costs to sell was based on the discounted cash flow method (level 3 input factors). The detailed planning period covers a respective time period of five years; for (groups of) CGUs, which have been allocated an asset with an indefinite useful life, such time period ends in perpetuity. Individual costs of capital are determined for each (group of) CGU(s), for the purpose of discounting projected cash flows. These capital costs are based on data incorporating beta factors, borrowing costs, as well as the capital structure of the respective peer group. Pricing, trading volumes, assets under custody, market share assumptions or general business development assumptions are based on past experience or market research. Other key assumptions are mainly based on external factors and generally correspond to internal management planning. Significant macroeconomic indicators include, for instance, equity index levels, volatility of equity indices, as well as interest rates, exchange rates, GDP growth, unemployment levels and government debt. When calculating value in use, the projections are adjusted for the effects of future restructurings and performance investments, if appropriate.

At each reporting date, the Group assesses whether there are any indications that an impairment recognised for non-current assets in previous years (except goodwill) does no longer apply. If this is the case, the carrying amount of the asset is increased and the difference is recognised in profit or loss. The maximum amount of this reversal is limited to the carrying amount that would have resulted if no impairment loss had been recognised in previous periods. Deutsche Börse Group does not reverse any goodwill impairments.

Intangible assets

	Purchased software €m	Internally developed software €m	Goodwill €m	Payments on account and software in development €m	Other intangible assets €m	Total €m
Historical cost as at 1 Jan 2018	277.9	965.9	2,770.9	90.0	1,009.6	5,114.3
Acquisitions from business combinations	5.0	0	90.6	0	66.2	161.8
Disposals from change in scope of consolidation	0	-0.5	0	0	0	-0.5
Additions	13.2	36.4	0	44.8	0.4	94.8
Disposals	-107.2	0	0	-0.3	-1.4	-108.9
Reclassifications	0	74.0	0	-74.0	0	0
Exchange rate differences	0	0.3	4.1	0	4.3	8.7
Historical cost as at 31 Dec 2018	188.9	1,076.1	2,865.6	60.5	1,079.1	5,270.2
Acquisitions through business combinations	95.5	0	609.3	15.2	110.4	830.4
Additions	15.7	53.0	0	44.6	9.7	123.0
Disposals	-2.3	0	0	0	0	-2.3
Reclassifications	0	17.9	0	-17.9	-0.1	-0.1
Exchange rate differences	-1.0	0.2	-4.4	0	0.7	-4.5
Historical cost as at 31 Dec 2019	296.8	1,147.2	3,470.5	102.4	1,199.8	6,216.7
Amortisation and impairment losses as at 1 Jan 2018	241.3	680.4	0	3.2	98.4	1,023.3
Amortisation	18.6	79.4	0	0	29.4	127.4
Impairment losses	0	31.5	0	5.2	0	36.7
Disposals from change in scope of consolidation	0	-0.4	0	0	0	-0.4
Disposals	-106.8	0	0	-0.2	-1.4	-108.4
Amortisation and impairment losses as at 31 Dec 2018	153.1	790.9	0	8.2	126.4	1,078.6
Amortisation	20.3	77.7	0	0	32.5	130.5
Impairment losses	0	0	0	1.8	0	1.8
Disposals	-2.3	0	0	0	0	-2.3
Exchange rate differences	-0.2	0	0	-0.1	0	-0.3
Amortisation and impairment losses as at 31 Dec 2019	170.9	868.6	0	9.9	158.9	1,208.3
Carrying amount as at 31 Dec 2018	35.8	285.2	2,865.6	52.3	952.7	4,191.6
Carrying amount as at 31 Dec 2019	125.9	278.6	3,470.5	92.5	1,040.9	5,008.4

Software, payments on account and software in development

Additions to software mainly relate to the implementation of the European Central Securities Depositories Regulation (CSDR) in the Clearstream (post-trading) segment and the development of the Investment Fund Services in the IFS segment.

Carrying amounts of material software and software in development as well as remaining amortisation periods of software applications

	Carrying amount ¹⁾ as at		Remaining amortisation period as at	
	31 Dec 2019 €m	31 Dec 2018 €m	31 Dec 2019 years	31 Dec 2018 years
Eurex (financial derivatives)				
C7	34.5	36.9	1.5 – 4.9	2.5 – 4.9
T7 trading platform for derivatives	16.7	20.5	0.4 – 4.9	0.9 – 4.9
Eurex Clearing Prisma	9.6	16.8	0.3 – 3.7	1.3 – 4.7
OTC CCP	12.1	11.9	1.5 – 4.9	0.3 – 4.9
Clearstream (post-trading)				
TARGET2-Securities (T2S)	59.1	71.8	2.9 – 4.1	3.9 – 5.1
1CAS Custody & Portal	31.8	37.9	5.2	6.2
CSD-R	53.6	31.3	n.a.	n.a.
LMP	9.9	9.0	4.9 – 5.2	6.2
Customer Onboarding	10.9	6.3	4.9	n.a.
IFS (Investment Fund Services)				
IFS Unity	12.1	4.7	5.0	n.a.
360T (foreign exchange)				
Trading platform of 360T group	18.4	18.5	2.8 – 6.9	1.8 – 6.9
Xetra (cash equities)				
T7 trading platform for the cash markets	9.1	8.4	2.9 – 4.9	3.9 – 5.5

1) Individual releases of a software application are combined and reported as a single asset

The impairment tests carried out at Deutsche Börse Group in 2019 resulted in impairment losses totalling €1.8 million (2018: €36.7 million). Impairment losses of €1.8 million (recoverable amount: negative) were disclosed in the fourth quarter of 2019 in the “depreciation, amortisation and impairment losses” item and relate to the carrying amount of the Regulatory Reporting Hub IT platform in the Data segment. The impairment was due to the discontinuation of the SFTR services, which led to a significant downgrade of revenue projections in line with preliminary customer feedback.

The recoverable amount was measured at fair value less costs to sell, using a discounted cash flow model (level 3 inputs).

Goodwill and other intangible assets from business combinations

Changes in goodwill classified by (groups of) CGUs

	Eurex €m	Clearstream €m	Qontigo (former STOXX) €m	360T €m	GSF €m	EEX €m	IFS €m	Data €m	Xetra €m	Total €m
Balance as at 1 Jan 2018	1,293.4	969.0	18.4	189.2	142.1	113.2	19.6	19.3	6.7	2,770.9
Acquisitions through business combinations	0	0.1	0	54.0	0	0	36.5	0	0	90.6
Exchange rate differences	0.1	0	0.1	0.9	0	2.4	0.5	0.1	0	4.1
Balance as at 31 Dec 2018	1,293.5	969.1	18.5	244.1	142.1	115.6	56.6	19.4	6.7	2,865.6
Acquisitions through business combinations	0	0	596.4	0	0	2.9	10.0	0	0	609.3
Exchange rate differences	0.1	-0.1	-6.3	1.1	0	1.0	-0.3	0.1	0	-4.3
Balance as at 31 Dec 2019	1,293.6	969.0	608.6	245.2	142.1	119.5	66.3	19.5	6.7	3,470.5

Other intangible assets are divided into the following categories:

Changes in other intangible assets by category

	Exchange licences €m	Trade names €m	Member and customer relationships €m	Miscellaneous intangible assets €m	Total €m
Balance as at 1 Jan 2018	23.0	458.2	425.7	4.3	911.2
Acquisitions through business combinations	0	1.7	64.1	0.4	66.2
Additions	0	0	0	0.4	0.4
Amortisation	0	-0.1	-28.2	-1.1	-29.4
Exchange rate differences	1.0	0.2	3.1	0	4.3
Balance as at 31 Dec 2018	24.0	460.0	464.7	4.0	952.7
Acquisitions through business combinations	0	65.4	44.0	1.0	110.4
Additions	0	0	8.5	1.2	9.7
Amortisation	0	-0.1	-31.2	-1.2	-32.5
Exchange rate differences	0.5	-0.6	0.8	0	0.7
Reclassifications	0	0	0	-0.1	-0.1
Balance as at 31 Dec 2019	24.5	524.7	486.8	4.9	1,040.9

Key assumptions used for impairment tests in 2019

(Group of) CGUs	Allocated Book Value €m	Risk-Free interest rate %	Market Risk Premium %	Discount Rate %	Perpetuity Growth Rate %	CAGR ¹⁾	
						Net Revenue %	Operating Costs %
Goodwill							
Eurex	1,293.6	-0.2	7.5	5.8	1.0	4.9	3.9
Clearstream	969.0	-0.2	7.5	7.0	1.0	3.1	3.3
Qontigo	608.5	-0.2	7.5	7.4	1.5	13.2	20.7
360T	245.2	-0.2	7.5	7.3	2.0	11.1	6.7
GSF	142.1	-0.2	7.5	8.1	1.5	4.6	2.6
EEX	119.5	-0.2	7.5	6.7	1.5	8.0	6.0
IFS	66.3	-0.2	7.5	7.8	1.5	9.9	5.5
Data	19.5	-0.2	7.5	7.6	1.5	3.6	5.5
Xetra	6.7	-0.2	7.5	6.2	1.0	2.8	3.1
Trade names and exchange licences							
STOXX	420.0	0.2	7.5	7.8	1.5	8.3	3.4
Axioma	64.3	2.3	6.0	8.5	1.5	26.6	16.9
Nodal	28.6	2.3	6.0	8.0	1.5	9.0	7.2
360T	19.9	0.2	7.5	7.7	2.0	8.7	4.5
EEX	14.3	0.2	7.5	7.0	1.5	5.6	4.5
360TGTX	1.7	2.3	6.0	8.6	2.0	21.3	12.0
Structured Products	0.2	0.2	7.5	7.0	1.0	2.9	2.5

1) CAGR = compound annual growth rate in detailed planning period

Key assumptions used for impairment tests in 2018

(Group of) CGUs	Allocated Book Value €m	Risk-Free interest rate %	Market Risk Premium %	Discount Rate %	Perpetuity Growth Rate %	CAGR ¹⁾	
						Net Revenue %	Operating Costs %
Goodwill							
Eurex	1,293.5	0.9	6.5	7.2	1.0	8.0	3.9
Clearstream	969.1	0.9	6.5	7.4	1.0	4.7	0.8
360T	244.1	0.9	6.5	8.7	2.5	13.0	9.0
GSF	142.1	0.9	6.5	8.5	1.5	3.1	1.8
EEX	115.6	0.9	6.5	7.7	1.5	9.2	6.3
IFS	56.6	0.9	6.5	7.4	1.5	10.2	6.7
Data	19.4	0.9	6.5	7.5	1.5	6.5	4.2
STOXX	18.5	0.9	6.5	7.5	1.5	8.6	7.4
Xetra	6.7	0.9	6.5	7.3	1.0	3.2	-0.5
Trade names and exchange licenses							
STOXX	420.0	0.8	6.5	7.6	1.5	7.9	8.0
Nodal	28.0	2.9	6.5	9.4	1.5	13.6	10.0
360T Core	19.9	0.8	6.5	7.9	2.5	11.5	6.5
EEX Core	13.9	0.8	6.5	7.3	1.5	7.1	4.5
360TGTX	1.7	2.9	6.5	9.9	2.5	12.4	9.4
Structured Products	0.2	0.8	6.5	7.3	1.0	3.9	3.6

1) CAGR = compound annual growth rate in detailed planning period

Even in case of a reasonably possible change of the parameters, none of the above-mentioned CGUs, or groups of CGUs, would be impaired.

12. Property, plant and equipment

12.1 Measurement of property, plant and equipment

Depreciable items of property, plant and equipment are carried at cost less cumulative depreciation. The straight-line depreciation method is used. The carrying amount is immediately written down to its recoverable amount if the carrying amount is higher than its recoverable amount. Costs of an item of property, plant and equipment comprise all costs directly attributable to the production process, as well as an appropriate proportion of production overheads. No borrowing costs were recognised in the reporting period as they could not be directly allocated to any particular development project.

Useful life of property, plant and equipment

Asset	Depreciation period
Computer hardware	3 to 5 years
Office equipment	5 to 25 years
Leasehold improvements	based on lease term

Repair and maintenance costs are expensed as incurred.

If it is probable that the future economic benefits associated with an item of property, plant and equipment will flow to the Group and the cost of the asset in question can be reliably determined, expenditure subsequent to acquisition is added to the carrying amount of the asset as incurred. The carrying amounts of any parts of an asset that have been replaced are derecognised.

Property, plant and equipment (incl. right-of-use assets)

	Land and Buildings	Fixtures and fittings €m	Computer hardware, operating and office equipment as well as car pool	Advance payments made and construction in progress €m	Total €m
Historical costs as at 1 Jan 2018	0	84.3	390.7	2.2	477.2
Acquisitions through business combinations	0	0.3	0.6	0	0.9
Disposals from change in scope of consolidation	0	0	-0.1	0	-0.1
Additions	0	5.4	46.7	13.1	65.2
Disposals	0	-6.5	-167.5	0	-174.0
Reclassifications	0	0	0.5	-0.5	0
Exchange rate differences	0	0	0.2	0	0.2
Historical costs as at 31 Dec 2018	0	83.5	271.1	14.8	369.4
Historical costs as at 1 Jan 2019	258.3	83.5	275.6	14.8	632.2
Acquisitions through business combinations	10.2	1.5	3.8	0	15.5
Additions	120.7	9.7	46.3	8.1	184.8
Disposals	0	-24.5	-12.6	-0.3	-37.4
Reclassifications	0	7.1	-0.2	-6.8	0.1
Exchange rate differences	-0.1	0.2	0.1	0	0.2
Historical costs as at 31 Dec 2019	389.1	77.5	313.0	15.8	795.4
Depreciation and impairment losses as at 1 Jan 2018	0	49.5	314.3	0	363.8
Depreciation	0	8.5	37.9	0	46.4
Disposals from change in scope of consolidation	0	0	-0.1	0	-0.1
Disposals	0	-5.8	-165.8	0	-171.6
Depreciation and impairment losses as at 31 Dec 2018	0	52.2	186.3	0	238.5
Depreciation	42.5	7.8	43.6	0	93.9
Disposals	0	-22.5	-12.3	0	-34.8
Exchange rate differences	0.1	0.2	-0.5	0	-0.2
Depreciation and impairment losses as at 31 Dec 2019	42.6	37.7	217.1	0	297.4
Carrying amount as at 31 Dec 2018	0.0	31.3	84.8	14.8	130.9
Carrying amount as at 1 Jan 2019	258.3	31.3	89.3	14.8	393.7
Carrying amount as at 31 Dec 2019	346.5	39.8	95.9	15.8	498.0

12.2 Right-of-use assets

Deutsche Börse Group leases a number of various assets. This includes buildings, passenger vehicles and fixtures and fittings in land and buildings. Right-of-use assets are measured at cost. Any accumulated depreciation and impairment amounts are deducted from the cost of right-of-use assets as part of subsequent measurement. This does not apply to short-term leases with a term of not more than 12 months and leases for low-value assets. Expenses in the reporting year resulting from the above-mentioned short-term and low-value assets are reported in other operating expenses.

Useful life of property, plant and equipment

Asset	Depreciation period
Right-of-Use – Land and buildings	based on lease term
Right-of-Use – Car pool	based on lease term

As a lessor in the case of an operating lease, the Group presents the leased asset as an item of property, plant and equipment and measures such asset at amortised cost. The lease instalments received during the period are shown under other operating income.

Right-of-Use Assets

	Land and buildings	IT hardware, operating and office equipment, as well as car pool €m	Total €m
Historical costs as at 1 Jan 2019	258.3	4.5	262.8
Acquisitions through business combinations	10.2	3.0	13.2
Additions	120.7	2.3	123.0
Depreciation	-42.5	-2.7	-45.2
Exchange rate differences	-0.2	-0.1	-0.3
Carrying amount as at 31 Dec 2019	346.5	7.0	353.5

The term of the leases is 15.5 years on average.

Operating leases for buildings, some of which are subleased, have a maximum remaining term of 30 years. The lease contracts usually terminate automatically when the lease expires. The Group has options to extend some leases.

For details regarding the corresponding lease liabilities, please see [note 13.2](#).

13. Financial instruments

Financial assets and liabilities are recognised when the Deutsche Börse Group becomes a party to a financial instrument. A financial instrument is contract that gives rise to a financial asset of one entity and to a financial liability or equity instrument of another entity.

Financial instruments are measured at fair value upon initial recognition. The fair value of financial instruments not measured at fair value through profit or loss has to include individually attributable transaction costs as incidental acquisition costs which result in an increase of the fair value of financial assets and a decrease in the fair value of a financial liability upon origination.

In accordance with IFRS 13, the fair value is defined as a selling price, which is the price that market participants receive when selling an asset or pay when transferring a liability in the context of an orderly transaction. The fair value is either a price determined on an active market is determined or on the on the basis of valuation models. The relevant inputs for the respective measurement model are either directly observable on the market or are otherwise determined using expert estimates.

Financial assets

Recognition and initial measurement

Regular way purchases and sales of financial assets are generally recognised and derecognised at the trade date. Purchases and sales of debt instruments classified as “at amortised cost” and of equities eligible for clearing via the central counterparties (CCPs) of Deutsche Börse Group are recognised and derecognised at the settlement date. Financial assets are derecognised when the contractual rights to the cash flows expire or when the company transfers these rights in a transaction that transfers substantially all risks and rewards of ownership of the financial assets.

Clearstream Banking S.A. acts as a principal in securities borrowing and lending transactions in the context of the ASLplus securities lending system and is an intermediate between lender and borrower without becoming a contracting party from an economic perspective. Consequently, these transactions are not recognised in the consolidated balance sheet.

Deutsche Börse Group allocates its financial assets to the following measurement categories, based on the business model for managing the financial assets and the contractual cash flow characteristics.

- At fair value (either at “fair value through other comprehensive income” (FVOCI) or “fair value through profit or loss” (FVPL))
- At amortised cost (aAC)

Deutsche Börse Group does not make use of the option to designate financial assets at fair value through profit or loss upon initial recognition (fair value option).

A significant change (modification) of the contractual terms of a financial instrument measured at amortised cost results in the derecognition of the original financial instrument and the recognition of a new financial asset. Insignificant changes lead to an adjustment of the carrying amount, without the relevant financial instrument being derecognised.

The Group reclassifies debt instruments when – and only when – its business model for managing such items has changed.

Subsequent measurement of debt instruments

Deutsche Börse Group allocates each debt instrument in one of the following categories:

- **Amortised cost (aAC):** Assets allocated to the “hold” business model and whose cash flows consist of solely payments of principal and interest are measured at amortised cost using the effective interest method, less any allowances for expected credit losses. Any gain or loss is recognised in profit or loss at the time the asset is derecognised or impaired. Interest income is included in financial income or in net interest income from banking business using the effective interest rate method. Foreign-exchange gains and losses are presented in other operating income or expenses or in financial income or expense.
- **Fair value through other comprehensive income (FVOCI):** Deutsche Börse Group did not apply the “hold and sell” business model in the reporting period and therefore did not allocate any debt instruments to this measurement category.
- **Fair value through profit or loss (FVPL):** Financial assets that do not meet the criteria for measurement at amortised cost or at FVOCI, are measured at FVPL. A gain or loss is recognised in profit or loss and included as a net amount in the consolidated income statement within net income from strategic investments in the period in which it arises.

Subsequent measurement of equity instruments

Deutsche Börse Group subsequently measures all equity investments not held for trading purposes at fair value. Where the Group’s management irrevocably opted for presenting fair value gains and losses on equity investments in other comprehensive income, there is no subsequent reclassification of fair value gains and losses to profit or loss following the derecognition of the investment, but a reclassification to retained earnings. Dividends from such financial instruments are recognised in profit or loss as net income from strategic investments when the Group’s right to receive payments is established and when such dividends are not capital repayments. As at the reporting date, Deutsche Börse Group has designated all equity instruments as at fair value through other comprehensive income.

Impairment

Any impairment for expected credit losses for debt instruments reported at amortised cost and at fair value through other comprehensive income are determined using a three-stage model. They represent a forward-looking measurement of future losses that are generally subject to estimates. The expected credit loss corresponds to either that of the coming 12 months or that of the entire lifetime of the corresponding instrument. The impairment methodology applied depends on whether there has been a significant increase in credit risk. A loss allowance equal to twelve-month expected credit losses is recognised unless the credit risk on a financial instrument has increased significantly since initial recognition. Within Deutsche Börse Group, the expected credit losses for trade receivables are measured based on the simplified approach, which requires lifetime expected losses to be recognised from initial recognition of a receivable.

- **Stage 1:** The impairment upon initial recognition is measured on the basis of the expected losses for the next 12 months.
- **Stage 2:** If a financial asset's credit risk has increased significantly without a resulting impairment, the expected credit loss is determined over the entire term. A significant increase in credit is determined individually using internal ratings.
- **Stage 3:** If the financial asset is impaired, the impairment is measured on the basis of the lifetime expected credit loss. If observable data indicating severe financial difficulties are available and there is a high default risk, a financial asset is classified as impaired, even if the definition of default is not yet met. Indications for impairment may include liquidity problems, the request to restructure debt as well as a breach of contract. A credit-risk-induced contractual adjustment always leads to an impairment of the financial asset.

Default probabilities are derived mainly from internal ratings. Financial assets are considered to have low credit risk if listed bonds and other financial investments or counterparties have an investment-grade credit rating.

Deutsche Börse Group has identified the following two triggers to identify an event of default and which cause a transfer to stage 3 accordingly:

- **Legal default:** a contractual partner is unable to fulfil its contractual obligation according to an agreement with Deutsche Börse Group due to insolvency/bankruptcy.
- **Contractual default:** a contractual partner is unable or unwilling to fulfil, in a timely manner, one or more of its scheduled contractual obligations according to an agreement with Deutsche Börse Group. The non-fulfilment of the contractual obligation could potentially result in a financial loss for Deutsche Börse Group.

For trade receivables, a default is assumed for amounts which are overdue for more than 360 days. The following criteria are used for the assessment of derecognition:

- Insolvency proceedings are not started due to missing substance of the debtor.
- Insolvency proceedings have not resulted in any payment for a period of three years, and there is no indication that any amount will be received going forward.
- Enforcement activities are not pursued by Deutsche Börse Group due to cost-benefit analysis, or Deutsche Börse Group has tried unsuccessfully to collect the receivable for a period of three years.

Financial liabilities

Financial liabilities are recognised when a Group company becomes a party to the instrument. Purchases and sales of equities via the central counterparty Eurex Clearing AG are recognised at the settlement date analogous to financial assets.

Offsetting financial assets and liabilities

Financial assets and liabilities are offset and only the net amount is presented in the consolidated balance sheet when a Group company currently has a legally enforceable right to set off the recognised amounts and intends either to settle on a net basis or to realise the asset and settle the liability simultaneously.

Financial liabilities measured at amortised cost

Financial liabilities not held for trading are carried at amortised cost. The borrowing costs associated with the placement of financial liabilities are included in the carrying amount and accounted for using the effective interest method if they are directly attributable. Discounts are amortised over the term of the liabilities.

Financial liabilities measured at fair value through profit or loss

A forward transaction with a non-controlling shareholder for the acquisition of non-controlling interests that is settled in cash or by delivering other financial assets is a financial liability recognised at fair value. It is subsequently measured at fair value through profit or loss. The equity interest attributable to a non-controlling shareholder underlying the transaction is accounted for as if it had already been acquired at the time of the transaction.

Deutsche Börse Group does not make use of the option to designate financial liabilities at fair value through profit or loss upon initial recognition (fair value option).

Deutsche Börse Group's exposure to various risks associated with the financial instruments is discussed in [note 23](#). The maximum exposure to credit risk at the end of the reporting period is the carrying amount of each class of financial assets mentioned above.

Derivative financial instruments and hedge accounting

Derivative financial Instruments are measured at fair value through profit or loss unless they are hedging instruments as part of hedge accounting. Deutsche Börse Group applies the hedge accounting principles set out in IFRS 9. Deutsche Börse Group uses derivative financial instruments to hedge existing or expected transactions in order to reduce interest rate risks or foreign-exchange risks. Changes in the fair value of derivative financial instruments are measured either in profit or loss in the consolidated income statement or, in the case of cash flow hedges, in other comprehensive income after taking into account deferred taxes.

Hedge accounting is generally of minor significance at Deutsche Börse Group. Hedging instruments used by Deutsche Börse Group within the context of hedge accounting are only derivatives that are used solely as economic hedges of forecast future cash flows of highly probable transaction and not for speculative investments, e.g. by hedging the purchase price to be paid in a foreign currency against currency risks within the context of corporate transaction.

Upon entering into a transaction designated for hedging purposes, Deutsche Börse Group documents the economic relation between the hedging instrument and the hedged item. The hedging relationship must be effectively at any time, i.e. the performance of the hedging instrument must almost fully compensate the performance of the hedged item. The dollar offset method as well as regression analyses are used to measure effectiveness. Ineffectiveness may arise as regards the timing of the forecast future cash flows or if the hedged item ceases to exist.

The documentation also comprises information about the Group's expectations to that extent the hedging instrument contributes to offsetting the fluctuations of the cash flows earned with the hedged item. Derivatives that do not or no longer fulfil the documentation or effectiveness requirements for the recognition under hedge accounting principles, whose hedged item no longer exists or for which the hedge accounting provisions are not applied are reported in the category "financial assets and liabilities at fair value through profit or loss". The Group also documents its risk management objective and strategy for undertaking various hedge transactions at that point in time.

The fair value of a derivative used for hedging purposes is reported as a non-current asset or a non-current liability when the remaining term of the hedged item is more than 12 months. In contrast, the fair value of such derivatives is shown as either a current asset or a current liability when the remaining term of the hedged item is not more than 12 months.

13.1 Equity investments measured at fair value through other comprehensive income

This item comprises strategic investments which are not held for trading and which Deutsche Börse Group has irrevocably elected to recognise at fair value through other comprehensive income in this category at initial recognition.

The material strategic investments of Deutsche Börse Group are as follows:

Equity investments at fair value through other comprehensive income

	2019 €m	2018 €m
Listed securities	12.5	19.1
Bombay Stock Exchange Ltd.	12.5	19.1
Unlisted securities	53.8	89.7
Taiwan Futures Exchange Corp.	0	42.6
Digital Asset Holdings LLC	8.7	6.2
Trifacta Inc.	6.6	5.4
Trumid Holdings LLC	17.1	12.8
S.W.I.F.T. SCRL	10.8	10.2
Other	10.7	12.5
Total	66.3	108.8

None of the equity investments have been pledged as collateral by Deutsche Börse Group.

As at 31 December 2019, the fair value of these equity investments was €66.3 million (2018: €108.8 million). Dividend payments of €1.3 million (2018: €2.9 million) from these equity investments were recorded in net income from strategic investments. In addition, disposals led to a net gain on realisation of €10.5 million (2018: €-7.2 million), recognised outside profit or loss in retained earnings.

Amounts recognised in profit or loss and other comprehensive income

	2019 €m	2018 €m
Gains/(losses) recognised in other comprehensive income;	10.5	-7.2
Dividends from equity investments held at FVOCI recognised in profit or loss		
Related to investments held at the end of the reporting period	1.3	2.9
Total	11.8	-4.3

13.2 Financial assets and liabilities measured at amortised cost

Financial assets measured at amortised cost primarily include the following:

- Trade receivables
- Debt securities
- Receivables in connection with securities transactions
- Reverse repurchase agreements
- Money market transactions
- Central counterparty balances
- Restricted bank balances
- Other cash and bank balances

Financial liabilities measured at amortised cost primarily include the following financial instruments:

- Issued bonds and commercial paper,
- Trade payables,
- Liabilities in connection with securities transactions as well as
- Cash deposits by market participants

Financial assets measured at amortised cost

Composition of fair value of financial assets at amortised cost

	31 Dec 2019			31 Dec 2018		
	Non-current €m	Current €m	Total €m	Non-current €m	Current €m	Total €m
Listed debt securities	693.0	592.1	1,285.1	1,052.0	572.4	1,624.4
Expected loss on listed debt securities						
Stage 1	0	0	0	0	0	0
Total expected loss on listed debt securities	0	0	0	0	0	0
Listed debt securities net of expected loss	693.0	592.1	1,285.1	1,052.0	572.4	1,624.4
Trade Receivables	0	454.4	454.4	0	403.2	403.2
Expected loss on trade receivables						
Stage 1/2	0	-1.1	-1.1	0	-0.9 ¹⁾	-0.9
Stage 3	0	-6.0	-6.0	0	-4.8 ¹⁾	-4.8
Total expected loss on trade receivables	0	-7.1	-7.1	0	-5.7	-5.7
Trade receivables net of expected loss	0.0	447.3	447.3	0	397.5	397.5
Other financial assets measured at amortised cost						
Reverse Repurchase Agreements	0	6,394.3	6,394.3	0	6,516.2	6,516.2
Balances on nostro accounts (bank balances)	0	1,596.2	1,596.2	0	2,244.7	2,244.7
Money market lendings	0	6,435.7	6,435.7	0	6,435.9	6,435.9
Margin calls	0	8.0	8.0	0	18.5	18.5
Customer overdrafts from settlement business	0	231.7	231.7	0	2,253.3	2,253.3
Loans and receivables to related parties and other investors	0.3	0.1	0.4	0.4	0.1	0.5
Interest receivables	0	47.1	47.1	0	45.2	45.2
Receivables from deposits	5.2	4.4	9.6	4.6	3.8	8.4
CCP balances	0	48.4	48.4	0	1,608.9	1,608.9
Other	0.1	23.6	23.7	0.1	23.6	23.7
Restricted bank balances	0	29,988.7	29,988.7	0	29,833.6	29,833.6
Other cash and bank balances	0	888.1	888.1	0	1,322.3	1,322.3
Total other financial assets measured at amortised cost	5.7	45,666.3	45,672.0	5.1	50,306.1	50,311.2
Other financial assets measured net of expected loss at amortised cost	5.7	45,666.3	45,672.0	5.1	50,306.1	50,311.2
Total	698.7	46,705.7	47,404.4	1,057.1	51,276.0	52,333.1

1) Prior year figures adjusted

Financial liabilities measured at amortised cost

Composition of financial liabilities at amortised cost

	31 Dec 2019 Carrying amount			31 Dec 2018 Carrying amount		
	Non-current €m	Current €m	Total €m	Non-current €m	Current €m	Total €m
Bonds issued	2,286.2	0	2,286.2	2,283.2	0	2,283.2
Cash deposits by market participants	0	29,755.8	29,755.8	0	29,559.2	29,559.2
Trade payables	0	206.7	206.7	0	195.0	195.0
Deposits from securities settlement business	0	13,725.6	13,725.6	0	16,796.8	16,796.8
Commercial papers issued	0	311.9	311.9	0	402.2	402.2
Money market lendings	0	19.2	19.2	0	36.6	36.6
Bank overdrafts	0	5.2	5.2	0	0	0
Margin deposits	0	31.0	31.0	0	17.9	17.9
Interest accruals	0	35.8	35.9	0	36.6	36.6
Leasing Liabilities	341.0	41.5	382.5	0	0	0
Liabilities from CCP positions	0	49.9	49.9	0	1,714.9	1,714.9
Associate payables	0	0.7	0.7	0	0.1	0.1
Miscellaneous	0	4.4	4.4	0	19.6	19.6
Total	2,627.2	44,187.9	46,815.1	2,283.2	48,778.9	51,062.1

The financial liabilities recognised on the balance sheet were not secured by liens or similar rights as at 31 December 2018 or as at 31 December 2019.

13.3 Restricted bank balances

Amounts reported separately under liabilities as cash deposits by market participants are restricted. Such amounts are mainly invested via bilateral or triparty reverse repurchase agreements and in the form of overnight deposits at banks (restricted bank balances). Government and government-guaranteed bonds with an external rating of at least AA– are accepted as collateral for the reverse repurchase agreements. Reported restricted bank balances total €29,988.7 million (2018: €29,833.6 million).

13.4 Cash deposits by market participants

Composition of cash deposits by market participants

	31 Dec 2019 €m	31 Dec 2018 €m
Liabilities from margin payments		
Liabilities from margin payments to Eurex Clearing AG by clearing members	25,461.9	23,673.9
Liabilities from margin payments to European Commodity Clearing AG by clearing members	3,794.7	5,502.2
Liabilities from margin payments to Nodal Clear, LLC by clearing members	494.2	372.7
Liabilities from margin payments to European Energy Exchange AG by clearing members	0.3	0.3
Liabilities from cash deposits by participants in equity trading	4.7	10.1
Total	29,755.8	29,559.2

13.5. Financial instruments at fair value through profit or loss

Deutsche Börse Group measures the following financial instruments at fair value:

- Financial instruments held by central counterparties
- Derivatives
- Other financial instruments measured at fair value through profit or loss: Financial assets include, in particular, investment fund units, convertible bonds and loans with an option to convert the loan into equity, as well as financial instruments from an incentive programme. Contingent purchase price components are reported in financial liabilities.

Financial instruments held by central counterparties

European Commodity Clearing AG, Nodal Clear, LLC and Eurex Clearing AG act as central counterparties:

- Eurex Clearing AG guarantees the settlement of all transactions involving futures and options on Eurex Germany. It also guarantees the settlement of all transactions for Eurex Repo (repo trading platform), certain exchange transactions in equities on Frankfurter Wertpapierbörse (FWB, the Frankfurt Stock Exchange) and certain cash market transactions on the Irish Stock Exchange. Eurex Clearing AG also guarantees the settlement of off-order-book trades entered for clearing in the trading systems of the Eurex exchanges, Eurex Bonds, Eurex Repo, the Frankfurt Stock Exchange and the Irish Stock Exchange. In addition, Eurex Clearing AG clears over-the-counter (OTC) interest rate derivatives and securities lending transactions, where these meet the specified novation criteria.
- European Commodity Clearing AG guarantees the settlement of spot and derivatives transactions at the trading venues of EEX group and the connected partner exchanges.
- Nodal Clear, LLC, as part of the Nodal Exchange Group, is a Derivatives Clearing Organisation (DCO) registered in the United States and is the central counterparty for all transactions executed on Nodal Exchange.

The transactions of the clearing houses are only executed between the respective clearing house and a clearing member.

Purchases and sales of equities and bonds via the Eurex Clearing AG central counterparty are recognised and simultaneously derecognised at the settlement date.

For products that are marked to market (futures, options on futures as well as OTC interest-rate derivatives), the clearing houses recognise gains and losses on open positions of clearing members on each exchange day. By means of the variation margin, profits and losses on open positions resulting from market price fluctuations are settled on a daily basis. The difference between this and other margin types is that the variation margin does not comprise collateral, but is a daily offsetting of profits and losses in cash. Therefore, futures and OTC interest rate derivatives are not reported in the consolidated balance sheet. “Traditional” options, for which the buyer must pay the option premium in full upon purchase, are carried in the consolidated balance sheet at fair value. Receivables and liabilities from repo transactions and from cash-collateralised securities lending transactions are classified as held for trading and carried at fair value.

“Financial instruments held by central counterparties” are reported as non-current if the remaining maturity of the underlying transactions exceeds twelve months at the reporting date.

The fair values recognised in the consolidated balance sheet are based on daily settlement prices. These are calculated and published by the clearing house in accordance with the rules set out in the contract specifications (see also the clearing conditions of the respective clearing house).

Composition of financial instruments held by central counterparties

	31 Dec 2019 €m	31 Dec 2018 €m
Repo transactions	60,352.2	63,147.3
Options	23,126.5	40,428.1
Others	57.0	690.3
Total	83,535.7	104,265.7
thereof non-current	5,234.2	9,985.4
thereof current	78,301.5	94,280.3

The aggregate financial instruments held by central counterparties are classified into current and non-current in the consolidated balance sheet. Receivables and liabilities that may be offset against a clearing member are reported on a net basis. Financial liabilities of €890.0 million (31 December 2018: €212.0 million) were eliminated because of intra-Group GC Pooling transactions.

Derivatives

Where derivatives do not meet the hedge accounting criteria, they are classified as “held for trading” for accounting purposes and are accounted for at fair value through profit or loss. Deutsche Börse Group uses derivative financial instruments to hedge existing or expected transactions in order to reduce interest rate risks or foreign-exchange risks. As at the reporting date, the following transactions have been recognised:

Derivative Financial Instruments

	Notional amount 31 Dec 2019 €m	Carrying amount 31 Dec 2019 €m	Notional amount 31 Dec 2018 €m	Carrying amount 31 Dec 2018 €m
Assets				
Non-current				
Option to acquire equity investments	0.0	0	2.0	0.0
Total Non-current assets	0.0	0	2.0	0.0
Current				
Foreign currency derivatives not designated in hedges	827.0	1.4	2,094.8	4.7
Total Current assets	827.0	1.4	2,094.8	4.7
Total Assets	827.0	1.4	2,096.8	4.7
Liabilities				
Current				
Foreign currency derivatives not designated in hedges	2,138.6	25.9	1,289.5	3.0
Total Current liabilities	2,138.6	25.9	1,289.5	3.0
Total Liabilities	2,138.6	25.9	1,289.5	3.0

Deutsche Börse Group has entered into transactions involving derivatives to economically reduce the foreign-exchange rate risk. These transactions do not meet the hedge accounting requirements.

As at 31 December 2019, currency swaps expiring in less than seven months had a notional value of €2,965.6 million (31 December 2018: €3,383.2 million expiring in less than six months) as well as a negative fair value of €25.9 million (31 December 2018: positive fair value of €4.7 million and negative fair value amounting to €2.9 million). These swaps were entered into to convert foreign currencies resulting from the commercial paper programme into euros and to economically hedge short-term foreign currency receivables and liabilities in euros.

Cash flow hedges that qualify for hedge accounting

The effective portion of changes in the fair value of derivatives that are designated and qualify as cash flow hedges are recognised in other comprehensive income. Hedge ineffectiveness is directly recognised in profit or loss in the consolidated income statement within net interest income from banking business or financial income or expenses.

When a hedging instrument expires or is sold or terminated, or when a hedge no longer meets the criteria for hedge accounting, hedge accounting is discontinued. When the forecast transaction is no longer expected to occur, the cumulative gain or loss and deferred costs of hedging that were reported in equity are immediately reclassified to profit or loss.

Other financial assets and liabilities FVPL

The other financial assets FVPL essentially include non/current investment fund shares in amount of €28.4 million (December 31, 2018: €14.6 million). The other financial liabilities FVPL include non-current contingent purchase price components in amount of €84.3 million (31 December 2018: €0.2 million) and a current put option of €3.6 million (31 December 2018: nil) related to the acquisition of Axioma.

Amounts recognised in profit or loss

	2019 €m	2018 €m
Fair value gains (losses) on other financial assets at FVPL recognised in other gains/(losses)	6.3	– 1.5
Distributions from ETFs	0.3	0.3
Fair value gains (losses) on contingent purchase price components	– 0.2	0.6
Total	6.4	– 0.6

13.6 Fair value hierarchy

The financial assets measured at fair value includes financial assets and liabilities of the following three hierarchy levels:

- **Level 1:** Financial instruments with a quoted price for identical assets and liabilities in an active market.
- **Level 2:** Financial instruments with no quoted prices for identical instruments on an active market and whose fair value is determined using valuation methods based on observable market parameters (e.g. OTC derivatives).
- **Level 3:** Financial instruments where the fair value is determined using one or more unobservable significant inputs. This does not apply to equity instruments

There were no transfers between levels for recurring fair value measurements during the year under review.

Fair value hierarchy

	Fair value as at 31 Dec 2019	thereof attributable to:		
		Level 1	Level 2	Level 3
	€m	€m	€m	€m
Assets				
Financial assets measured at fair value through other comprehensive income				
Strategic investments	66.3	12.5	0	53.8
Total	66.3	12.5	0	53.8
Financial assets FVPL				
Non-current financial instruments held by central counterparties	5,234.2	0	5,234.2	0
Other non-current financial assets at FVPL	28.4	11.3	0	17.2
Current financial instruments of the central counterparties	78,301.5	0	78,301.5	0
Current derivatives	1.4	0	1.4	0
Other current financial assets at FVPL	0.4	0	0	0.4
Total	83,565.9	11.3	83,537.2	17.5
Total assets	83,632.2	23.8	83,537.2	71.3
Liabilities	-82,759.5	0	-82,671.6	-87.9
Financial liabilities FVPL				
Non-current financial instruments of the central counterparties	-5,234.2	0	-5,234.2	0
Non-current financial liabilities FVPL	-84.3	0	0	-84.3
Current financial instruments held by central counterparties	-77,411.5	0	-77,411.5	0
Current derivatives	-25.9	0	-25.9	0
Current financial liabilities FVPL	-3.6	0	0	-3.6
Total liabilities	-82,759.5	0	-82,671.6	-87.9

Fair value hierarchy previous year

	Fair value as at	thereof attributable to:		
	31 Dec 2018	Level 1	Level 2	Level 3
	€m	€m	€m	€m
Assets	104,396.9	27.7	104,270.4	98.8
Financial assets measured at fair value through other comprehensive income				
Strategic investments	108.8	19.1	0	89.7
Total	108.8	19.1	0	89.7
Financial assets held for trading				
Non-current financial instruments of the central counterparties	9,985.4	0	9,985.4	0
Other non-current financial assets at FVPL	17.3	8.6	0	8.7
Current financial instruments of the central counterparties	94,280.3	0	94,280.3	0
Current derivatives	4.7	0	4.7	0
Other current financial assets at FVPL	0.4	0	0	0.4
Total	104,288.1	8.6	104,270.4	9.1
Total assets				
Liabilities	-104,056.9	0	-104,056.7	-0.2
Financial liabilities FVPL				
Non-current financial instruments of the central counterparties	-9,985.4	0	-9,985.4	0
Non-current financial liabilities at fair value through profit or loss (FVPL)	-0.2	0	0	-0.2
Current financial instruments held by central counterparties	-94,068.3	0	-94,068.3	0
Current derivatives	-3.0	0	-3.0	0
Total liabilities	-104,056.9	0	-104,056.7	-0.2

The fair value of a financial instrument is measured using quoted market prices, if available. If no quoted market prices are available, observable market prices, for example for interest rates or exchange rates, are used. This observable market information is then used as inputs for financial valuation techniques, e.g. option pricing models, discounted cash flow models or net asset value. In isolated instances, fair value is determined exclusively on the basis of internal valuation models.

Changes in level 3 financial instruments

	Financial Assets		Financial Liabilities	Total
	Strategic investments m €	measured at fair value through profit or loss m €	measured at fair value through profit or loss m €	
Balance as at 1 Jan 2018	67.8	7.6	-1.1	74.3
Acquisitions from business combinations	0.1	0	0	0.1
Additions	13.6	3.1	0	16.7
Disposals	-0.3	-1.8	0.3	-1.8
Realised capital gains/(losses)	0	0.2	0.6	0.8
Financial results	0	0	-0.1	-0.1
Other operating expenses	0	-0.1	0	-0.1
Other operating income	0	0.4	0.7	1.1
Net income from strategic investments	0	-0.1	0	-0.1
Changes recognised in the revaluation surplus	7.5	0	0	7.5
Unrealised gains/(losses) fro currency translation recognised in equity	1.0	0	0	1.0
Balance as at 31 Dec 2018	89.7	9.1	-0.2	98.6
Acquisitions from business combinations	0	0	-84.0	-84.0
Additions	0.9	7.9	-0.3	8.5
Disposals	-42.7	-0.3	0	-43.0
Reclassifications	3.3	-3.3	0	0
Unrealised capital gains/(losses) recognised in profit or loss	0	4.1	-3.5	0.6
Other operating expenses	0	0	0.1	0.1
Result from strategic investments	0	4.1	0	4.1
Staff cost	0	0	-3.6	-3.6
Changes recognised in the revaluation surplus	1.9	0	0	1.9
Unrealised gains/(losses) fro currency translation recognised in equity	0.6	0	0	0.6
Balance as at 31 Dec 2019	53.8	17.5	-87.9	-16.7

The value of level 3 equity investments is reviewed on a quarterly basis using internal valuation models. In the year under review, a strategic investment of the FVOCI category was fully sold which led to a disposal in the amount of €42.7 million. Moreover, debt instruments previously measured at fair value were converted into equity, resulting in a reclassification within Level 3 in the amount of €3.3 million. In addition, investment fund units measured at fair value through profit or loss were acquired in the amount of €7.9 million. The measurement of the investment fund units at fair value had an effect on profit or loss amounting to €4.1 million reported in net income from strategic investments.

The acquisition of Axioma Inc. resulted in an addition of €84.0 million from the application of the anticipated purchase method which has to be reported as part of the consideration transferred as a financial liability measured at fair value through profit or loss (see [note 2](#)). The Principal Manager Shareholder Put Option granted within the scope of the acquisition resulted in a measurement gain in the amount of €3.6 million recognised in profit or loss.

There were no further material changes in the reporting year regarding financial assets and liabilities allocated to Level 3. A change in the parameters observable on the market, taking into account realistic

alternative assumptions, would not have any material effects on the carrying amounts of the unlisted equity securities measured at fair value through profit or loss as at the reporting date.

The bonds issued by Deutsche Börse Group have a fair value of €2,451.1 million (31 December 2018: €2,422.9 million) and are disclosed under liabilities measured at amortised cost. The fair value of such instruments is based on the debt instruments' quoted prices. Due to insufficient market liquidity, the liabilities were allocated to level 2.

Fixed-income securities held by Deutsche Börse Group have a fair value of €1,360.1 million (31 December 2018: €1,627.0 million). They are recognised as part of debt instruments measured at amortised cost. The fair value of the securities was determined by reference to published price quotations in an active market. The securities were allocated to level 1.

The financial instrument's carrying amount for all other items represents a reasonable approximation of the fair value.

13.7 Offsetting financial instruments

Gross presentation of offset financial instruments held by central counterparties

	Gross amount of financial instruments		Gross amount of offset financial instruments		Net amount of financial instruments	
	31 Dec 2019 €m	31 Dec 2018 €m	31 Dec 2019 €m	31 Dec 2018 €m	31 Dec 2019 €m	31 Dec 2018 €m
Financial assets from repo transactions	104,334.5	98,083.3	-43,982.3	-34,936.0	60,352.2	63,147.3
Financial liabilities from repo transactions	-103,444.5	-97,871.3	43,982.3	34,936.0	-59,462.2	-62,935.3
Financial assets from options	78,171.1	76,089.8	-55,044.6	-35,661.7	23,126.5	40,428.1
Financial liabilities from options	-78,171.1	-76,089.8	55,044.6	35,661.7	-23,126.5	-40,428.1

13.8 Cash or securities collateral held by central counterparties

As the clearing houses of the Deutsche Börse Group guarantee the settlement of all traded contracts, they have established multi-level collateral systems. The central pillar of the collateral systems is the determination of the overall risk per clearing member (margin) to be covered by cash or securities collateral. Losses calculated on the basis of current prices and potential future price risks are covered up to the date of the next collateral payment.

In addition to these daily collateral payments, each clearing member must make contributions to the respective default fund (for further details, see the [risk report in the combined management report](#)). Cash collateral is reported in the consolidated balance sheet under "cash deposits by market participants" and the corresponding amounts under "restricted bank balances".

Securities collateral is generally not derecognised by the clearing member providing the collateral, as the opportunities and risks associated with the securities are not transferred to the secure party. Recognition at the secure party is only permissible if the clearing member providing the transfer is in default according to the underlying contract.

The aggregate margin calls based on the executed transactions and default fund requirements after haircuts was €52,889.4 million as at the reporting date (2018: €47,969.5 million). Collateral totalling €61,711.0 million (2018: €58,992.9 million) was actually deposited.

Composition of collateral held by central counterparties

	31 Dec 2019 €m	31 Dec 2018 €m
Cash collateral (cash deposits) ¹⁾²⁾	26,489.6	29,240.5
Securities and book-entry securities collateral ³⁾⁴⁾	35,221.4	29,752.4
Total	61,711.0	58,992.9

- 1) The amount includes the clearing fund totalling €2,914.5 million (2018: €2,938.3million)
- 2) The collateral value is determined on the basis of the fair value less a haircut amounting to €345.3 million (2018: €344.4 million)
- 3) The amount includes the clearing fund totalling €2,055.2 million (2018: €1,789.1 million)
- 4) The collateral value is determined on the basis of the fair value less a haircut amounting to €4,595.4 million (2018: €4,243.9 million)

14. Other current assets

Composition of other current assets

	31 Dec 2019 €m	31 Dec 2018 €m
Other receivables from CCP transactions (commodities)	208.7	543.9
Prepaid expenses	66.5	50.4
Tax receivables (excluding income taxes)	39.7	41.6
Interest receivables on taxes	19.3	0
Miscellaneous	6.7	3.9
Total	340.9	639.8

15. Equity

Changes in equity are presented in the consolidated statement of changes in equity. As at 31 December 2019, the number of no-par value registered shares of Deutsche Börse AG in issue was 190,000,000 (31 December 2018: 190,000,000).

Subject to the agreement of the Supervisory Board, the Executive Board is authorised to increase the subscribed share capital by the following amounts:

Composition of authorised share capital

	Amount in € (shares)	Date of authori- sation by the shareholders	Expiry date	Existing shareholders' pre-emptive rights may be disappplied for fractioning and/or may be disappplied if the share issue is:
Authorised share capital I ¹⁾	13,300,000	11 May 2016	10 May 2021	n.a.
Authorised share capital II ¹⁾	19,300,000	13 May 2015	12 May 2020	<ul style="list-style-type: none"> ▪ for cash at an issue price not significantly lower than the stock exchange price, up to a maximum amount of 10 per cent of the nominal capital. ▪ against non-cash contributions for the purpose of acquiring companies, parts of companies, interests in companies, or other assets.
Authorised share capital III ¹⁾	38,600,000	13 May 2015	12 May 2020	n.a.
Authorised share capital IV ¹⁾	6,000,000	17 May 2017	16 May 2022	n.a.

1) Shares may only be issued, excluding shareholders' pre-emptive subscription rights, provided that the aggregate amount of new shares issued excluding shareholders' pre-emptive rights during the term of the authorisation (including under other authorisations) does not exceed 20 per cent of the issued share capital

Contingent capital

By resolution of the Annual General Meeting of 8 May 2019, the Executive Board is authorised, subject to the consent of the Supervisory Board, to issue in the period until 7 May 2024 on one or several occasions convertible bonds and/or warrant-linked bonds or a combination of such instruments with a total principal amount of up to €5,000,000,000 with or without a limited term and to grant holders or creditors of such bonds conversion or option rights, respectively, to acquire new no-par value registered shares in Deutsche Börse AG representing a notional interest in the share capital of up to €17,800,000, as stipulated in the terms and conditions of convertible bonds or the terms and conditions of the warrants attaching to the warrant-linked bonds.

The Executive Board is authorised, subject to the consent of the Supervisory Board, to exclude the subscription rights of the shareholders in relation to bonds with conversion or option rights to acquire shares in Deutsche Börse AG in the following cases: The Executive Board is authorised, subject to the approval of the Supervisory Board, to exclude shareholders' pre-emptive rights to bonds with conversion or option rights to shares of Deutsche Börse AG in the following cases: (i) to avoid fractional amounts, (ii) when the issue price of a bond is not materially below the theoretical fair value determined in accordance with recognised financial techniques and the total number of shares attributable to these bonds does not exceed 10 per cent of the share capital, (iii) to grant the holders of conversion or option rights to shares of Deutsche Börse AG subscription rights to offset any dilutive effects to the same extent as they would be entitled to receive after exercising these rights.

The bonds may also be issued by companies based in Germany or abroad that are affiliated with Deutsche Börse AG within the meaning of sections 15 ff. of the Aktiengesetz (AktG, German Stock Corporation Act). Accordingly, the share capital was contingently increased by up to €17,800,000 (contingent capital 2019). To date, the authorisation to issue convertible bonds and/or bonds with warrants has not been exercised.

There were no further subscription rights to shares as at 31 December 2019 or 31 December 2018.

Revaluation surplus

The development of the revaluation surplus is as follows:

Revaluation surplus

	Recognition of hidden reserves from fair value measurement €m	Equity investments measured at FVOCI €m	Cashflow- Hedges €m	Defined benefit obligations €m	Other €m	Total €m
Balance as at 1 Jan 2018 (gross)	103,7	23,7	0	- 153,2	0	- 25,8
Changes from defined benefit and similar obligations	0	0	0	- 23,9	- 0,3	- 24,2
Fair value measurement	0	- 7,2	0	0	0	- 7,2
Balance as at 31 Dec 2018 (gross)	103,7	16,5	0	- 177,1	- 0,3	- 57,2
Changes from defined benefit and similar obligations	0	0	0	- 42,1	- 0,9	- 43,0
Fair value measurement	0	- 10,4	0,2	0	0	- 10,2
Balance as at 31 Dec 2019 (gross)	103,7	6,1	0,2	- 219,2	- 1,2	- 110,4
Deferred taxes						
Balance as at 1 Jan 2018	0	- 1,7	0	41,9	0	40,2
Additions	0	0,1	0	6,9	0,1	7,1
Reversals	0	- 0,3	0	0	0	- 0,3
Balance as at 31 Dec 2018	0	- 1,9	0	48,8	0,1	47,0
Additions	0	0,1	0	11,1	0,2	11,4
Reversals	0	0	- 0,1	0	0	- 0,1
Balance as at 31 Dec 2019	0	- 1,8	- 0,1	59,9	0,3	58,3
Balance as at 1 Jan 2018 (net)	103,7	22,0	0	- 111,3	0	14,4
Balance as at 31 Dec 2018 (net)	103,7	14,6	0	- 128,3	- 0,2	- 10,2
Balance as at 31 Dec 2019 (net)	103,7	4,3	0,1	- 159,3	- 0,9	- 52,1

Accumulated profit

The “accumulated profit” item includes exchange rate differences amounting to €–8.2 million (2018: €–6.8 million). €2.1 million (2018: €–8.2 million) was withdrawn due to currency translation for foreign subsidiaries in the reporting period and €0.7 million (2018: €1.4 million) was added relating to transactions used to hedge against currency risk.

Regulatory capital requirements and regulatory capital ratios

As in the past, Clearstream Banking S.A., Clearstream Banking AG and Eurex Clearing AG, in their capacity as credit institutions, are subject to solvency supervision by the German or Luxembourg banking supervisory authorities (Bundesanstalt für Finanzdienstleistungsaufsicht, BaFin, and Commission de Surveillance du Secteur Financier, CSSF, respectively). The same applies to the Clearstream Holding at a regulatory group level. Eurex Repo GmbH and 360 Treasury Systems AG are also subject to specific provisions applicable to certain investment firms under BaFin solvency supervision.

Since the authorisation of both Eurex Clearing AG and European Commodity Clearing AG as central counterparties under the provisions of Regulation (EU) No 648/2012 (European Market Infrastructure Regulation, EMIR) in 2014, these companies have been subject to the capital requirements under Article 16 EMIR. These requirements apply to Eurex Clearing AG in parallel to the solvency supervision requirements applicable to credit institutions. In each concrete case, the more stringent requirement has to be met. Irrespective of its status as a specialist credit institution according to German law, European Commodity Clearing AG is only subject to EMIR capital requirements.

Clearstream Banking AG, Clearstream Banking S.A. and LuxCSD S.A. are central securities depositories (CSDs) within the meaning of Article 2 Paragraph 1 Number 1 of the Regulation (EU) No. 909/2014 (Central Securities Depositories Regulation, CSDR). In January 2020, for Clearstream Banking AG the CSD licence pursuant to Article 16 CSDR was granted by BaFin as of 21 January 2020. As a result, the company is subject to the capital requirements set forth in Article 47 CSDR. While the review of remaining applications for authorisation of Clearstream Banking AG (according to Article 54 CSDR), Clearstream Banking S.A. and LuxCSD S.A. by the respective supervisory authorities is ongoing, the companies partially operate under existing transitional provisions. In addition, Clearstream Banking AG and Clearstream Banking S.A. will also be subject to a capital surcharge for credit institutions applicable for the provision of intra-day credit pursuant to Article 54 Paragraph 3 Letter d CSDR.

Nodal Clear, LLC is a Derivatives Clearing Organisation (DCO) subject to regulation by the US Commodity Futures Trading Commission (CFTC).

REGIS-TR S.A., as a trade repository according to EMIR, is subject to supervision exercised by the European Securities and Markets Authority (ESMA).

Powernext SAS is a market company according to Article L. 421-2 of the Monetary and Financial Code (Code monétaire et financier) and therefore is subject to supervision exercised by Autorité des marchés financiers (AMF).

The EMIR capital requirements for central counterparties are, in large part, based on the EU own funds requirements for credit institutions, but the details differ in relation to the capital components, the capital requirement components and capital deduction items. Moreover, EMIR does not specify any capital buffers such as those introduced by the Directive 2013/36/EU (Capital Requirements Directive, CRD IV) and Regulation (EU) No 575/2013 (Capital Requirements Regulation, CRR) for banks.

Since 1 January 2014, the own funds requirements for credit institutions have been primarily subject to the EU-wide requirements of the CRR as well as the supplementary national regulations implementing CRD IV, which transposed the “Basel III” rules into European law.

All companies that are directly or indirectly (i.e. by means of EMIR requirements) subject to the CRR own funds requirements are exempted from compliance with trading book requirements. Market risk exposures consist only of relatively small open foreign currency positions. The companies concerned uniformly apply the standardised approach for credit risk. As a result of the specific business of the credit institutions and central counterparties belonging to Deutsche Börse Group, their recognised assets are subject to sharp fluctuations. This leads to correspondingly volatile total capital ratios at the Clearstream companies. The volatility of the ratio is subject to major fluctuations on a day-to-day basis in the course of the year. Due to a high degree of collateralised or zero-weighted cash investments, the own funds requirements for credit and market risk exposures of Eurex Clearing AG and European Commodity Clearing AG are relatively stable despite volatile total assets in the course of the year.

To calculate operational risk, Eurex Clearing AG and European Commodity Clearing AG use the basic indicator approach, while the Clearstream companies apply the advanced measurement approach (AMA).

Due to the specific arrangements for the two investment firms, Eurex Repo GmbH and 360 Treasury Systems AG, no explicit own funds requirements for operational risk are determined in accordance with Article 95 CRR. Instead, the total own funds requirement is determined either as the own funds requirement amount for credit and market risk or as 25 per cent of fixed overhead costs, depending on which is higher. Since credit and market risks are low, the relevant criterion for both companies is the own funds requirement on the basis of overhead costs.

None of the Group companies subject to solvency supervision has neither Additional Tier 1 nor Tier 2 supplementary capital.

A minimum total capital ratio of 8 per cent generally applies to credit institutions subject to the CRR. In addition, CRD IV introduced various capital buffers, which the supervised (credit) institutions generally have to meet over and above the minimum total capital ratio of 8 per cent, although they may temporarily fall below these levels. The capital buffers were introduced in stages up until 1 January 2019, depending on the economic environment and systemic risk components: since 2014, CSSF has imposed a standard capital conservation buffer of 2.5 per cent of Tier 1 capital on all Luxembourg credit institutions; this arrangement represents a departure from the general transitional provisions of CRD IV. For all German credit institutions, a capital conservation buffer was phased-in (1.875 per cent throughout 2018 and 2.5 per cent starting from 1 January 2019). Similarly, a countercyclical capital buffer is required to be available in order to ensure that banks accumulate a buffer during a period in which a specific region experiences economic growth, while such a buffer may fall to a lower level during an economic downturn in such region. The respective per centage is generally determined by the competent authority of the country in which the (credit) risk positions are located. Therefore, a bank's individual per centage is a combined rate, which takes into account the total volume of credit transactions in the various countries. As at 31 December 2019, the bank-specific countercyclical buffer requirements stood at 0.04 per cent of risk-weighted assets for Clearstream Banking S.A, at the level of 0.02 per cent for Clearstream Holding and at the level of 0.01 per cent for Clearstream

Banking AG, whereas for Eurex Clearing AG it was equal to 0.03 per cent. In addition, a systemic risk buffer must be applied if required by the competent authority. As at 31 December 2019, the systemic risk buffer was not yet required in Luxembourg nor in Germany. In general, the credit institutions that are subject to the provisions of the CRR fall into two groups: those designated as not systemically important, which includes Clearstream Banking AG, Clearstream Holding group and Eurex Clearing AG; and those designated as “Other Systemically Important Institution (O-SII)”, which includes Clearstream Banking S.A. as of 1 January 2018. As a result, CSSF imposed on Clearstream Banking S.A., according to Regulation CSSF No. 18-06, a buffer for O-SIIs amounting to 0.5 per cent, effective since 1 January 2019.

The individual companies' capital resources sufficiently reflect the fluctuation in risk-weighted assets. Stress considerations are used to determine the capital required for expected peaks, and additional reserves for unexpected events are added. In addition, buffers are taken into account for the calculation of the recovery indicators specified in the recovery plans. The objective of these indicators is to prevent triggering recovery events. The capital requirements determined in this way will be used for the mid-term capital planning. As the actual capital requirements are below these expected peaks, this may lead to a higher actual total capital ratio (solvency ratio).

The own funds requirements of Clearstream Group decreased moderately in the reporting period. Capital requirement for Clearstream Banking AG slightly increased while for Clearstream Banking S.A. they decreased. Changes occurred regarding own funds requirements for operational risks as well as credit and market risks, both at the single-entity and Group levels.

In the medium to long term, the Clearstream Group expects increasing own funds requirements at a regulatory group level for the following reasons:

- The future applicability of own funds requirements based on CSDR
- The establishment of own funds requirements resulting from the introduction of minimum requirements for equity and eligible liabilities (MREL) as a result of Directive (EU) No 59/2014
- The implementation of the so-called CRR II package and other amendments under Basel III

Eurex Clearing AG's own funds requirements decreased compared with the previous year. Given the increase in revenues in the past years, own funds requirements for operational risk rose according to the model; while own funds requirements for credit and market risk declined.

The own funds requirements for operational risk calculated with Eurex Clearing AG's internal risk model are higher than the own funds requirements derived from the basic indicator approach, which is based on the profit and loss statement as prescribed by CRR. Hence, Eurex Clearing AG always applies additional capital buffers for such risks, surpassing regulatory minimum requirements. Against this background, banking supervisors requested in 2011 that Eurex Clearing AG increase the basis for the calculation of regulatory own funds requirements by considering an appropriate share of clearing-related fees received for the account of operating entities. The own funds requirements for operational risk are calculated once a year based on a three-year average of historical income, including the assumed clearing fees, and are therefore not subject to daily fluctuations. Compliance with the minimum regulatory ratio is maintained at all times due to the sufficient capital buffer for uncollateralised cash investments.

Eurex Clearing AG's capital requirements according to EMIR are currently significantly above CRR and CRD IV capital requirements. Independently of this, the capital resources of Eurex Clearing AG are reviewed on an ongoing basis and monitored as part of medium-term capital planning. Eurex Clearing AG received contributions to its capital reserve in an amount of €100.0 million in 2019 from parent company Eurex Frankfurt AG. Further contributions are scheduled for the coming years, in order to continuously strengthen Eurex Clearing AG's capital base. Eurex Clearing AG's own contribution to the default fund increased in 2019 to €200.0 million.

Composition of own funds requirements

	Own funds requirements for operational risk		Own funds requirements for credit and market risk		Total capital requirements	
	31 Dec 2019 €m	31 Dec 2018 €m	31 Dec 2019 €m	31 Dec 2018 €m	31 Dec 2019 €m	31 Dec 2018 €m
Clearstream Holding group	450.6	409.9	63.2	146.9	513.8	556.6
Clearstream Banking S.A.	324.5	312.5	53.2	93.5	327.7	406.0
Clearstream Banking AG	126.2	97.4	6.5	5.9	132.7	103.2
Eurex Clearing AG	80.6	75.2	16.2	26.1	96.8	101.3

Regulatory capital ratios according to CRR

	Own funds requirements		Regulatory equity		Total capital ratio	
	31 Dec 2019 €m	31 Dec 2018 €m	31 Dec 2019 €m	31 Dec 2018 €m	31 Dec 2019 %	31 Dec 2018 %
Clearstream Holding group	513.8	556.6	1,559.5	1,525.5	24.3	21.9
Clearstream Banking S.A.	377.7	406.0	1,149.4	1,112.0	24.4	21.9
Clearstream Banking AG	132.7	103.2	369.7	369.3	22.3	28.6
Eurex Clearing AG	96.8	101.3	614.8	514.8	50.8	40.6

The capital requirements under Article 16 EMIR do not stipulate a specific ratio. Instead, the total amount of share capital, retained earnings and reserves, less certain items (including the central counterparty's own contribution to the default fund), is compared with the capital requirements. This total has to be at least equal to these requirements. In other words, EMIR requires a capital cover of at least 100 per cent. A reporting requirement to the competent authority – in this case BaFin – is triggered when this ratio falls below 110 per cent.

The capital resources of European Commodity Clearing AG are currently well above the regulatory requirements. As at the reporting date, total equity as disclosed in the statement of financial position was fully available to cover the risks according to Article 16 of EMIR, given that this equity fulfil the required liquidity standards. Similar to the other companies, the capital base is consistently monitored. Given the increase in the regulatory minimum requirements for contributions to the default fund, European Commodity Clearing AG's default fund contribution was increased. As at 31 December 2019, European Commodity Clearing AG's total default fund contribution amounted to €15.0 million, and thus exceeded

regulatory minimum requirements. Depending on the future business performance, and in particular on changes in the regulatory framework, the capital resources will be adjusted as needed.

Capital adequacy requirements under EMIR

	Eurex Clearing AG		European Commodity Clearing AG	
	31 Dec 2019 €m	31 Dec 2018 €m	31 Dec 2019 €m	31 Dec 2018 ¹⁾ €m
Own funds requirement for operational, credit and market risk	96.8	101.3	25.2	23.2
Other EMIR capital requirements	76.2	77.9	41.9	42.0
Total EMIR capital requirements under Article 16 of EMIR	173.0	179.2	67.1	65.2
Equity	614.8	514.8	118.9	108.9
EMIR deductions	0	0	0	0
Own contribution to default fund	-200.0	-150.0	-15.0	-11.5
EMIR capital adequacy ratio	414.8	364.8	103.9	97.4

1) Prior year adjusted.

Composition of own funds/capital requirements

	Own funds requirements for credit and market risk		Additional own funds requirements on the basis of fixed overheads		Own funds requirements to be met	
	31 Dec 2019 €m	31 Dec 2018 €m	31 Dec 2019 €m	31 Dec 2018 €m	31 Dec 2019 €m	31 Dec 2018 €m
Eurex Repo GmbH	0.6	0.5	1.8	2.8	2.4	3.3
360 Treasury Systems AG	5.2	7.4	4.3	1.0	9.5	8.4

Compliance with own funds requirements

	Own funds requirements		Regulatory equity		total capital ratio	
	31 Dec 2019 €m	31 Dec 2018 €m	31 Dec 2019 €m	31 Dec 2018 €m	31 Dec 2019 %	31 Dec 2018 ¹⁾ %
Eurex Repo GmbH	2.4	3.3	21.9	18.0	72.5	43.6
360 Treasury Systems AG	9.5	8.4	32.8	28.8	27.5	27.4

1) Prior year adjusted.

According to Article 21 (b) of the Delegated Regulation (EU) No 150/2013, REGIS-TR S.A. is required to maintain equity in the amount of at least 50 per cent of annual operating costs.

According to the MAS, EEX Asia Pte. Limited is required to maintain own funds at the rate of either 18 per cent of annual operating revenue or 50 per cent of annual operating costs, depending on which is higher. Regarding the anticipated upswing in the business development of EEX Asia Pte. Limited, we expect slightly increasing own funds requirements. Its capital base will be adjusted, if required.

Powernext SAS is obliged continuously comply with a capital adequacy ratio of at least 8.0 per cent set forth in “Arrêté du 2 juillet 2007 relatif au capital minimum, aux fonds propres et au contrôle interne des entreprises de marché”. The capital adequacy ratio is equal to the ratio between the overall capital and the equity requirements for operational risk, multiplied by 12,5. The operational risk is calculated via the 3 years average net banking income multiplied with 15.0 per cent. Additionally, Powernext SAS need to proof a share capital higher than €730 thousand and higher than 50.0 per cent of operating costs at recognition. Furthermore the company’s capital (equity) must exceed 50 per cent of current operating costs. All regulatory requirements are fulfilled as of 31 December 2019.

Given its DCO status, Nodal Clear, LLC is obliged to maintain sufficient financial resources to cover all current costs for a minimum period of twelve months; moreover, Nodal Clear, LLC must provide sufficient highly liquid assets to cover all current costs for at least six months.

Compliance with own funds requirements

	Own funds requirements		Regulatory equity	
	31 Dec 2019 €m	31 Dec 2018 ¹⁾ €m	31 Dec 2019 €m	31 Dec 2018 ¹⁾ €m
REGIS-TR S.A.	5.7	5.2	9.3	9.9
EEX Asia Pte. Limited ²⁾	0.6	0.9	1.5	1.6
Powernext SAS	3.7	3.6	27.4	25.8
Nodal Clear LLC	24.5	23.3	31.1	26.4

1) Prior year adjusted.

2) In 2018, operated as Cleartrade Exchange Pte. Limited.

The regulatory minimum requirements were complied with at all times by all companies during the reporting period and in the period up to the preparation of the consolidated financial statements.

16. Shareholders' equity and appropriation of net profit of Deutsche Börse AG

The annual financial statements of the parent company Deutsche Börse AG, prepared as at 31 December 2019 in accordance with the provisions of the Handelsgesetzbuch (HGB, the German Commercial Code), report net profit for the period of €825.9 million (2018: €532.2 million) and equity of €2,867.5 million (2018: €2,526.5 million). In 2019, Deutsche Börse AG distributed €495.0 million (€2.70 per share) from the unappropriated surplus of the previous year.

Proposal on the appropriation of the unappropriated surplus

	31 Dec 2019 €m
Net profit for the period	825.9
Appropriation to other retained earnings in the annual financial statements	– 265.9
Unappropriated surplus	560.0
Proposal by the Executive Board:	
Distribution of a regular dividend to the shareholders of €2.90 per share for 183,429,035 no-par value shares carrying dividend rights	531.9
Appropriation to retained earnings	28.1

No-par value shares carrying dividend rights

	31 Dec 2019 Number	31 Dec 2018 Number
Number of shares issued as at the reporting date	190,000,000	190,000,000
Number of treasury shares as at the reporting date	–6,570,965	–6,652,955
Number of shares outstanding as at the reporting date	183,429,035	183,347,045

The proposal on the appropriation of the unappropriated surplus reflects treasury shares held directly or indirectly by the company that do not carry dividend rights under section 71b of the Aktiengesetz (AktG, the German Stock Corporation Act). The number of shares carrying dividend rights can change until the Annual General Meeting through the repurchase or sale of further treasury shares. In this case, with a dividend of €2.90 per eligible share, an amended resolution for the appropriation of the unappropriated surplus will be proposed to the Annual General Meeting.

17. Provisions for pensions and other employee benefits

Defined benefit pension plans

Provisions for pensions and similar obligations are measured using the projected unit credit method on the basis of actuarial reports in accordance with IAS 19. Calculating the present value requires certain actuarial assumptions (e.g. discount rate, staff turnover rate, salary and pension trends) to be made. The current service cost and the net interest expense or income for the subsequent period are calculated on the basis of these assumptions.

The fair value of plan assets is deducted from the present value of pension obligations, reflecting the asset ceiling rules if there are any excess plan assets. This results in the net defined benefit liability or asset. Net interest expense for the financial year is calculated by applying the discount rate determined at the beginning of the financial year to the net defined benefit liability determined as at that date.

The relevant discount rate is determined by reference to the return on long-term corporate bonds with a rating of at least AA (Moody's Investors Service, S&P Global Ratings, Fitch Ratings and DBRS) on the basis of the information provided by Bloomberg, and a maturity that corresponds approximately to the maturity of the pension obligations. Moreover, the bonds must be denominated in the same currency as the underlying pension obligation. Measurement of the pension obligations in euros is, in principle, based on a discount rate which is determined according to the Towers Watson "GlobalRate:Link" methodology updated in line with the current market trend.

The actuarial gains or losses and the difference between the expected and the actual return or loss on plan assets are recognised in other comprehensive income in the revaluation surplus. They result from changes in expectations with regard to life expectancy, pension trends, salary trends and the discount rate.

Other long-term benefits for employees and members of executive boards (total disability pension, transitional payments and surviving dependants' pensions) are also measured using the projected unit credit method. Actuarial gains and losses and past service cost are recognised immediately and in full through profit or loss.

The defined benefit obligations of the companies of Deutsche Börse Group relate primarily to final salary arrangements and pension plans based on capital components, which guarantee employees a choice of either lifelong pensions or capital payments on the basis of the final salary paid. Deutsche Börse Group uses external trust solutions to cover some of its pension obligations.

Net liability of defined benefit obligations

	Germany €m	Luxembourg €m	Other €m	Total 31 Dec 2019 €m	Total 31 Dec 2018 €m
Present value of defined benefit obligations that are at least partially funded	506.7	84.2	25.6	616.5	531.9
Fair value of plan assets	-351.6	-55.7	-20.9	-428.2	-372.1
Funded status	155.1	28.5	4.7	188.3	159.8
Present value of unfunded obligations	4.3	0.7	0.1	5.1	4.3
Net liability of defined benefit obligations	159.4	29.2	4.8	193.4	164.1
Impact of minimum funding requirement/asset ceiling	0	0	0	0	0
Amount recognised in the balance sheet	159.4	29.2	4.8	193.4	164.1

The defined benefit plans comprise a total of 2,772 beneficiaries (2018: 2,768). The present value of defined benefit obligations can be allocated to the beneficiaries as follows:

Allocation of the present value of the defined benefit obligation to the beneficiaries

	Germany €m	Luxembourg €m	Other €m	Total 31 Dec 2019 €m	Total 31 Dec 2018 €m
Eligible current employees	213.6	81.8	24.3	319.7	294.9
Former employees with vested entitlements	189.4	2.4	0.3	192.1	149.8
Pensioners or surviving dependants	108.1	0.7	1.0	109.8	91.5
	511.1	84.9	25.6	621.6	536.2

Essentially, the retirement benefits encompass the following retirement benefit plans:

Executive boards of Group companies (Germany and Luxembourg)

Individual commitment plans exist for executive board members of certain Group companies; they are based on the plan for executives described in the second paragraph below, i.e. in each calendar year the company provides an annual contribution to a capital component calculated in accordance with actuarial principles. The benefit assets equal the total of the acquired capital components of the individual years and are converted into a lifelong pension once the benefits fall due. In addition, retirement benefit agreements are in place with members of the executive boards of Group companies, under which they are entitled to pension benefits upon reaching the age of 63 and following reappointment. When the term of office began, the replacement rate was 30 per cent of individual pensionable income. It rose by 5 per centage points with each reappointment, up to a maximum of 50 per cent of pensionable income. Details of the pension commitments for members of Deutsche Börse AG's Executive Board can be found in the [remuneration report](#).

Germany

There is an employee-funded deferred compensation plan for employees of certain Deutsche Börse Group companies in Germany who joined prior to 1 January 2019. Under this plan, it is possible to convert portions of future remuneration entitlements into benefit assets of equal value which bear interest of 6 per cent p.a. The benefits consist of a capital payment made in equal annual instalments over a period of three years upon the reaching the age of 65 or at an earlier date due to disability or death.

In the period from 1 January 2004 to 30 June 2006, executives in Germany were offered the opportunity to participate in the following pension system based on capital components: the benefit is based on annual income received, composed of fixed annual salary and the variable remuneration. Every year, participating Group companies provide for an amount that corresponds to a certain per centage of the pensionable income. This amount is multiplied by a capitalisation factor depending on age, resulting in the “annual capital component”. The benefit assets equal the total of the acquired capital components of the individual years and are converted into a lifelong pension once the benefits fall due. This benefit plan was closed to new staff on 30 June 2006; the executives who were employed in the above period can continue to earn capital components.

As part of adjustments to the remuneration systems to bring them into line with supervisory requirements contracts were adjusted for some executives. For executives affected, whose contracts allowed for the inclusion of only the income received and the variable remuneration above the upper limit of the contribution assessment as pensionable income, the pensionable income was determined on the basis of income received from the year 2016. This will be adjusted to account for the increase of the cost of living according to the consumer price index for Germany as issued by the Federal Statistical Office. For executives affected, whose capital components were calculated on the basis of income received, without observing the upper limit of the contribution assessment, an amount has been determined that will be reviewed annually, and adjusted if necessary, by the Supervisory Board, taking any changes in circumstances in terms of income and purchasing power into account.

Luxembourg

The defined benefit pension plan in favour of Luxembourg employees is funded by means of cash contributions to an “association d'épargne pension” (ASSEP) organized in accordance with Luxembourg law. The benefits consist of a one-off capital payment, which is generally paid upon reaching the age of 65. Contributions to the ASSEP are funded in full by the participating companies. The contributions are determined annually on the basis of actuarial opinions in accordance with Luxembourg law.

Changes in net defined benefit obligations

	Present value of obligations		Fair value of plan assets		Total	
	2019 €m	2018 €m	2019 €m	2018 €m	2019 €m	2018 €m
Balance as at 1 Jan	536.2	507.6	-372.1	-363.4	164.1	144.2
Changes through business combinations	0.1	0	0	0	0.1	0
Current service cost	26.1	27.4	-	-	26.1	27.4
Interest expense/(income)	9.2	8.9	-6.5	-6.5	2.7	2.4
Past service cost and gains and losses on settlements	-	2.7	-	-	0	2.7
	35.3	39.0	-6.5	-6.5	28.8	32.5
Remeasurements						
Return on plan assets, excluding amounts already recognised in interest income	-	-	-22.5	22.9	-22.5	22.9
Adjustments to demographic assumptions	-	-0.5	-	-	-	-0.5
Adjustments to financial assumptions	70.3	3.7	-	-	70.3	3.7
Experience adjustments	-5.6	-2.3	-	-	-5.6	-2.3
Effect of exchange rate differences	-	-	-	-	0	0
	64.7	0.9	-22.5	22.9	42.2¹⁾	23.8¹⁾
Effect of exchange rate differences	0.6	0.5	-0.5	-0.2	0.1	0.3
Contributions:						
Employers	-	-	-42.5	-37.3	-42.5	-37.3
Plan participants	0.8	0.6	-0.8	-0.6	0	0
Benefit payments	-15.2	-11.6	15.2	11.6	0	0
Settlements	-	-	-	-	0	0
Tax and administration costs	-0.9	-0.8	1.5	1.4	0.6	0.6
Balance as at 31 Dec	621.6	536.2	-428.2	-372.1	193.4	164.1

1) Thereof €-0.2 million (2018: €-0.1 million) in the offsetting item for non-controlling interests

In 2019 financial year, employees converted a total of €6.4 million (2018: €6.9 million) of their variable remuneration into deferred compensation benefits.

Assumptions

Provisions for pension plans and other employee benefits are measured annually at the reporting date using actuarial techniques. The assumptions for determining the actuarial obligations for the pension plans differ according to the individual conditions in the countries concerned and are shown in the following table:

Actuarial assumptions

	31 Dec 2019		31 Dec 2018	
	Germany %	Luxembourg %	Germany %	Luxembourg %
Discount rate	1.00	1.00	1.75	1.75
Salary growth	3.50	3.30	3.50	3.30
Pension growth	2.00	1.80	2.00	1.80
Staff turnover rate	2.00	2.00	2.00 ¹⁾	2.00 ¹⁾

1) Up to the age of 50, afterwards 0 per cent

In Germany, the “2018 G” mortality tables (generation tables) developed by Prof Klaus Heubeck are used. For Luxembourg, generation tables of the Institut national de la statistique et des études économiques du Grand-Duché de Luxembourg are used.

Sensitivity analysis

The sensitivity analysis presented in the following considers the change in one assumption at a time, leaving the other assumptions unchanged from the original calculation, i.e. possible correlation effects between the individual assumptions are not taken into account.

Sensitivity of defined benefit obligation to change in the weighted principal assumptions

	Change in actuarial assumption	Effect on defined benefit obligation		Effect on defined benefit obligation	
		2019 Defined benefit obligation €m	Change %	2018 Defined benefit obligation €m	Change %
Present value of the obligation ¹⁾		621.6	–	536.2	–
Discount rate	Increase by 1.0 per centage point	529.5	–14.8	460.2	–14.2
	Reduction by 1.0 per centage point	739.2	18.9	634.2	18.3
Salary growth	Increase by 0.5 per centage points	635.4	2.2	549.9	2.6
	Reduction by 0.5 per centage points	610.2	–1.8	529.1	–1.3
Pension growth	Increase by 0.5 per centage points	636.6	2.4	549.3	2.4
	Reduction by 0.5 per centage points	608.0	–2.2	525.6	–2.0
Life expectancy ²⁾	Increase by one year	640.4	3.0	551.2	2.8
	Reduction by one year	602.9	–3.0	522.4	–2.6

1) Present value of the obligations using assumptions in accordance with the ["Actuarial assumptions"](#) table

2) Prior year adjusted

Composition of plan assets

Germany

In Germany, plan assets are held by a trustee in safekeeping for individual companies of Deutsche Börse Group and the beneficiaries. At the company's instruction, the trustee uses the funds transferred to acquire securities, without any consulting by the trustee. The contributions are invested in accordance with an investment policy, which may be amended by the companies represented in the investment committee. The trustee may refuse to carry out instructions if they are in conflict with the fund's allocation rules or the payment provisions. In accordance with the investment policy, a value preservation mechanism is applied; investments can be made in different asset classes.

Luxembourg

In Luxembourg, the Board of Directors of the Clearstream Pension Fund is responsible for determining the investment strategy, with the aim of maximising returns in relation to a benchmark. This benchmark is 75 per cent derived from the return on five-year German federal government bonds and 25 per cent from the return on the EURO STOXX 50 Index. According to the investment policy, the fund may only invest in fixed-income and variable-rate securities, as well as listed investment fund units; it may hold cash, including in the form of money market funds.

Composition of plan assets

	31 Dec 2019		31 Dec 2018	
	€m	%	€m	%
Bonds	352.1	82.2	299.8	80.5
Government bonds	246.9		217.3	
Corporate bonds	105.2		82.5	
Derivatives	- 0.4	- 0.1	2.5	0.7
Stock index futures	0.4		- 0.3	
Interest rate futures	- 0.8		2.8	
Investment funds	26.1	6.1	20.7	5.6
Total listed	377.8	88.2	323.0	86.8
Qualifying insurance policies	21.0	4.9	16.9	4.5
Cash	29.4	6.9	32.2	8.7
Total not listed	50.4	11.8	49.1	13.2
Total plan assets	428.2	100.0	372.1	100.0

As at 31 December 2019, plan assets did not include any financial instruments held by the Group (2018: nil), nor did they include any property occupied or other assets used by the Group.

Risks

In addition to the general actuarial risks, the risks associated with the defined benefit obligations relate especially to financial risks in connection with the plan assets, including in particular counterparty credit and market risks.

Market risk

The return on plan assets is assumed to be the discount rate determined on the basis of corporate bonds with an AA rating. If the actual rate of return on plan assets is lower than the discount rate used, the net defined benefit liability increases accordingly. If volatility is low, the actual return is further expected to exceed the return on corporate bonds with a good rating in the medium to long term. The level of the net liability is influenced by the discount rates in particular, whereby the current low interest rates contribute to a relatively high net liability. Deutsche Börse Group considers the share price risk resulting from derivative positions in equity index futures in the plan assets to be appropriate. The company bases its assessment on the expectation that the overall volume of payments from the pension plans will be manageable in the next few years, that the total amount of the obligations will also be manageable and that it will be able to meet these payments in full from operating cash flows. Any amendments to the investment policy take into account the duration of the pension obligation as well as the expected payments over a period of ten years.

Inflation risk

Possible inflation risks that could lead to an increase in defined benefit obligations exist because some pension plans are final salary plans or the annual capital components are directly related to salaries, i.e. a significant increase in salaries would lead to an increase in the benefit obligation from these plans. In Germany, however, there are no contractual arrangements with regard to inflation risk for these pension plans. An interest rate of 6 per cent p.a. has been agreed for the employee-financed deferred compensation plan; the plan does not include any arrangements for inflation, so that it has to be assumed that there will be little incentive for employees to contribute to the deferred compensation plan in times of rising inflation. In Luxembourg, salaries are adjusted for the effects of inflation on the basis of a consumer price index no more than once a year; this adjustment leads to a corresponding increase in the benefit obligation from the pension plan. Since the obligation will be met in the form of a capital payment, there will be no inflation-linked effects once the beneficiary reaches retirement age.

Duration and expected maturities of the pension obligations

The weighted duration of the pension obligations is 16.7 years (2018: 16.1 years) as at 31 December 2019.

Expected maturities of undiscounted pension payments

	Expected pension payments ¹⁾ 31 Dec 2019 €m	Expected pension payments 31 Dec 2018 €m
Less than 1 year	14.9	19.6
Between 1 and 2 years	13.8	14.5
Between 2 and 5 years	48.0	42.8
More than 5 years up to 10 years	126.8	112.4
Total	203.5	189.3

1) The expected payments in Swiss francs were translated into euros at the relevant closing rate on 31 December

The expected costs of defined benefit plans (excluding service cost for deferred compensation) amount to approximately €16.4 million for the 2020 financial year, including net interest expense.

Defined contribution pension plans and multi-employer plans

Defined contribution plans

There are defined contribution plans as part of the occupational pension system using pension funds and similar pension institutions. In addition, contributions are paid to the statutory pension insurance scheme. The level of contributions is normally determined in relation to income. As a rule, no provisions are recognised for defined contribution plans. The contributions paid are reported as pension expenses in the year of payment. There are defined contribution pension plans for employees in several countries. In addition, the employer pays contributions to employees' private pension funds.

Multi-employer plans

Several Deutsche Börse Group companies are member institutions of BVV Versicherungsverein des Bankgewerbes a.G., a pension insurance provider with registered office in Berlin. Employees and employers make regular contributions, which are used to provide guaranteed pension plans, and a potential surplus. The contributions to be made are derived from contribution rates applied to active employees' monthly gross salaries, taking into account specific financial thresholds. Member institutions are liable in the second degree regarding the fulfilment of BVV's agreed pension benefits. However, we consider the risk that said liability will actually be utilised as remote. Given that BVV membership is governed by several Works Council Agreements, membership termination is subject to certain conditions. Deutsche Börse Group considers BVV pension obligations as multi-employer defined benefit pension plans. However, we currently lack information regarding the allocation of BVV assets to individual member institutions and the respective beneficiaries. Moreover, we do not know Deutsche Börse Group's actual share in BVV's total obligations. Hence, Deutsche Börse Group discloses this plan as a defined contribution plan. Based on its latest publications, BVV does not suffer any deficient cover with a potential impact on Deutsche Börse Group's future contributions.

EPEX Netherlands B.V. participates in the ABP pension fund within the EEX subgroup. Participation is mandatory for all employees. Employer contributions are calculated by ABP and adjusted, if necessary. Since the allocation of assets to member institutions and beneficiaries is not possible, this pension plan can also be presented only as a defined contribution plan.

During the reporting period, the costs associated with defined contribution plans, and designated multi-employer plans, amounted to €42.8 million (2018: €39.6million). In 2020, Deutsche Börse Group expects to make contributions to multi-employer plans amounting to around €10.2 million.

18. Changes in other provisions

Other provisions

Provisions are recognised if the Group has a present obligation from an event in the past, it is probable that there will be an outflow of resources embodying economic benefits to settle the obligation and the amount of this obligation can be estimated reliably. The amount of the provision corresponds to the best estimate of the expenditure required to settle the obligation at the reporting date.

A restructuring provision is only recognised when an entity has a detailed formal plan for the restructuring and has raised a valid expectation in those affected that the restructuring measures will be implemented, for example by starting to implement that plan or by announcing its principal features to those affected by it. Provisions in the context of the programme resolved in 2018 to reduce structural costs (Structural Performance Improvement Programme, SPIP) as well as provisions recognised for contractually agreed early retirement agreements and severance agreements, are recorded in other provisions.

Changes in other provisions (Part 1)

	Bonuses €m	Restructuring and efficiency measures €m	Share-based payments €m	Interest on taxes €m
Balance as at 1 Jan 2019	119.4	148.5	70.1	79.6
Changes in the basis of consolidation	0	-1.2	-0.5	0
Reclassification ¹⁾	-5.2	0	-0.4	0
Utilisation	-94.1	-36.6	-7.9	-10.5
Reversal	-13.3	-15.6	-2.3	-1.3
Additions	111.2	11.1	42.1	2.6
Currency translation	0.3	0.1	0.1	0
Interest	0	2.3	0	0
Balance as at 31 Dec 2019	118.3	108.6	101.3	70.4

Changes in other provisions (Part 2)

	Other tax provisions €m	Other personnel provisions €m	Anticipated Losses €m	Miscellaneous €m
Balance as at 1 Jan 2019	39.0	15.2	10.7	34.0
Changes in the basis of consolidation	0	-0.1	0	0.1
Reclassification ¹⁾	-0	-0.1	0	-0.8
Utilisation	-2.8	-6.7	0	-9.5
Reversal	-2.4	-0.7	-3.0	-3.7
Additions	0.3	2.0	0.8	4.6
Currency translation	0	0	0.1	0.1
Interest	0	0	0	0.2
Balance as at 31 Dec 2019	34.1	9.6	8.6	25.0

1) Relates primarily to reclassifications to the employee-funded deferred compensation plan (see [note 17](#)) as well as to reclassifications from liabilities

The other non-current and current provisions amount to a total of €476.0 million (31 December 2018: €516.5 million). The non-current provisions in amount of €225,2 million (31 December 2018: €209.9 million) essentially have a residual lifetime between one to five years. Furthermore current provisions exist in amount of €250.7 million (31 December 2018: €306.6 million).

Provisions for restructuring and efficiency measures include provisions for contractually agreed early retirement benefits and severance payments as well as expenses directly related to restructuring measures. Furthermore, this item includes provisions amounting to €16.8 million (31 December 2018: €59.0 million for the implementation of the restructuring plan).

For details on share-based payments, see [note 25](#).

19. Other current provisions

Deutsche Börse Group reports the following contract liabilities resulting from contracts with customers:

Contract liabilities

	31 Dec 2019 €m	31 Dec 2018 €m
Non-current contract liabilities	20.2	10.0
Current contract liabilities	21.5	5.4
Total	41.7	15.4

The business combination of Axioma led to an increase of contract liabilities by €24.5 million, which include accruals from „SaaS Middle Office“ products at the reporting date.

Composition of other current liabilities

	31 Dec 2019 €m	31 Dec 2018 €m
Liabilities from CCP positions	210.6	543.9
Tax liabilities (excluding income taxes)	50.6	36.4
Vacation entitlements, flexitime and overtime credits	27.7	24.5
Contract liability	21.5	5.4
Social security liabilities	8.3	6.8
Liabilities to employees	4.2	3.4
Liabilities to supervisory bodies	3.3	2.7
Deferred income	2.9	0.4
Miscellaneous	3.8	5.3
Total	332.9	628.8

Other disclosures

20. Consolidated cash flow statement disclosures

Composition of other non-cash income

	31 Dec 2019 €m	31 Dec 2018 €m
Subsequent measurement of non-derivative financial instruments	- 16.0	- 30.5
Reversal of discount and transaction costs from long-term financing	3.0	2.9
Reversal of the revaluation surplus for cash flow hedges	0	0.7
Equity method measurement	3.9	1.0
Impairment of financial instruments	1.8	0.9
Subsequent measurement of derivatives	26.4	0.8
Contract liabilities	26.3	- 1.2
Gains on the disposal of subsidiaries and equity investments	- 1.0	0
Miscellaneous	8.0	4.1
Total	52.5	- 21.3

Reconciliation to cash and cash equivalents

Reconciliation to cash and cash equivalents

	31 Dec 2019 €m	31 Dec 2018 €m
Restricted bank balances	29,988.7	29,833.6
Other cash and bank balances	888.1	1,322.3
Net position of financial instruments held by central counterparties	890.0	212.0
Current financial instruments measured at amortised cost	15,381.6	19,722.6
Less financial instruments with an original maturity exceeding 3 months	- 1,339.7	- 2,666.6
Current financial liabilities measured at amortised cost	- 14,225.4	- 19,024.7
Less financial instruments with an original maturity exceeding 3 months	317.9	1,999.0
Current liabilities from cash deposits by market participants	- 29,755.8	- 29,559.2
Cash and cash equivalents	2,145.5	1,839.0

21. Earnings per share

Under IAS 33, earnings per share are calculated by dividing the net profit for the period attributable to Deutsche Börse AG shareholders (net income) by the weighted average number of shares outstanding.

In order to determine diluted earnings per share, potentially dilutive ordinary shares that may be acquired under the share-based payment programmes (see also [note 25](#)) were added to the average number of shares. In order to calculate the number of potentially dilutive ordinary shares, the exercise prices were adjusted for the fair value of the services still to be provided.

In order to determine diluted earnings per share, the 2014 Long-term Sustainable Instrument (LSI) tranche, for which cash settlement has not been resolved, is assumed to be settled with equity instruments – regardless of actual accounting in accordance with IFRS 2. The following potentially dilutive rights to purchase shares were outstanding as at 31 December 2019:

Calculation of the number of potentially dilutive ordinary shares

Tranche	Exercise price	Adjustment of the exercise price according to IAS 33	Average number of outstanding options	Average price for the period ¹⁾	Number of potentially dilutive ordinary shares
	€	€	31 Dec 2019	€	31 Dec 2019
2014 ²⁾	0	0	3,252	126.10	3,252
Total					3,252

1) Volume-weighted average price of Deutsche Börse AG shares on Xetra calculated on a daily basis for the period 1 January to 31 December 2019

2) This relates to share subscription rights within the scope of the Long-term Sustainability Instrument (LSI) for senior executives. The quantity of subscription rights under the 2014 LSI tranche may still change from the quantity reported as at the reporting date, since subscription rights will only be granted in future financial years.

As the volume-weighted average share price calculated on a daily basis was higher than the adjusted exercise price for the 2014 tranche, these stock options are considered to be dilutive under IAS 33 as at 31 December 2019.

Calculation of earnings per share (basic and diluted)

	2019	2018
Number of shares outstanding as at beginning of period	183,347,045	186,610,158
Number of shares outstanding as at end of period	183,429,035	183,347,045
Weighted average number of shares outstanding	183,381,196	184,887,281
Number of potentially dilutive ordinary shares	3,252	7,605
Weighted average number of shares used to compute diluted earnings per share	183,384,448	184,894,886
Net income for the period (€m)	1,003.9	824.3
Earnings per share (basic) (€)	5.47	4.46
Earnings per share (diluted) (€)	5.47	4.46

As in the previous year, there were no subscription rights in 2019 that were excluded from the calculation of the weighted average of potentially dilutive shares for having a dilutive effect during the reporting year ending on the reporting date.

22. Segment reporting

Deutsche Börse divides its business in nine individual segments: This structure serves as a basis for the Group’s internal management and financial reporting (see the table entitled “Internal organisational and reporting structure” for details).

Segment reporting (part 1)

	Net revenues		Operating costs		EBITDA	
	2019 €m	2018 ¹⁾ €m	2019 €m	2018 €m	2019 in %	2018 in %
Eurex (financial derivatives)	957.1	936.1	-314.4	-376.3	68	60
EEX (commodities)	289.3	256.6	-169.6	-149.2	41	42
360T (foreign exchange)	92.1	78.8	-57.7	-49.9	37	37
Xetra (cash equities)	222.6	228.7	-101.7	-118.8	56	51
Clearstream (post-trading)	764.7	727.3	-305.0	-351.9	60	52
IFS (investment fund services)	183.1	154.3	-110.3	-108.3	40	30
GSF (collateral management)	78.0	83.1	-38.4	-48.4	49	41
Qontigo (index and analytics business)	190.2	157.3	-101.0	-53.9	47	66
Data (data business)	158.9	157.5	-66.3	-83.5	58	47
Total	2,936.0	2,779.7	-1,264.4	-1,340.2	57	52

1) As part of the combination, certain licence revenues were re-allocated from the Data segment to the new Qontigo segment (index and analytics business)

Segment reporting (part 2)

	Depreciation, amortisation and impairment losses		EBIT		CAPEX ¹⁾		Employees (as at 31 December)	
	2019 €m	2018 €m	2019 €m	2018 €m	2019 €m	2018 €m	2019	2018
Eurex (financial derivatives)	-53.6	-48.4	594.1	511.0	37.6	34.8	1,412.0	1,265.0
EEX (commodities)	-31.4	-26.5	88.0	80.7	28.6	21.2	829.0	725.0
360T (foreign exchange)	-19.3	-15.8	15.1	13.1	6.0	4.3	260.0	253.0
Xetra (cash equities)	-14.4	-11.3	110.4	104.2	13.0	8.8	483.0	488.0
Clearstream (post-trading)	-62.5	-50.0	396.9	325.2	55.3	57.8	1,776.0	1,767.0
IFS (investment fund services)	-19.2	-19.5	53.6	26.5	22.1	16.2	887.0	752.0
GSF (collateral management)	-5.0	-11.5	33.1	22.7	5.7	3.6	240.0	242.0
Qontigo (index and analytics business)	-12.5	-5.7	76.7	97.7	7.0	3.4	608.0	197.0
Data (data business)	-8.3	-21.8	84.2	52.1	9.4	9.9	280.0	275.0
Total	-226.2	-210.5	1,452.1	1,233.2	184.7	160.0	6,775.0	5,964.0

1) Excluding investments from business combinations

Sales revenue is presented separately by external sales revenue and internal (inter-segment) sales revenue. Inter-segment services are charged on the basis of measured quantities or at fixed prices, e.g. the provision of data by the Eurex (financial derivatives) segment to the Data segment. For an overview of intercompany revenues, see [note 4](#). Services between the segments are charged on the basis of assessed quantities or at fixed prices, e.g. data delivery from the Eurex segment (financial derivatives) to the Data segment.

Non-cash valuation allowances and bad debt losses resulted from the following segments:

Breakdown of non-cash valuation allowances and bad debt losses

	2019 €m	2018 €m
Eurex (financial derivatives)	0.2	0.2
360T (foreign exchange)	0.6	0.5
Xetra (cash equities)	0.9	1.4
Clearstream (post-trading)	0.9	-0.3
GSF (collateral management)	0.1	0.1
Qontigo (index and analytics business)	-0.8	1.2
Data (data business)	0.3	0.1
Total	2.2	3.2

In the prior year there was an impairment loss required to be recognised for strategic investments in amount of €0.6 million, see [note 8](#)). An additional impairment loss from developed software was recognised in the 2019 reporting year in amount of €1.8 million (2018: €36.7 million, see [note 11](#) and [note 12](#)).

Deutsche Börse Group's business model – and that of its segments – is focused on an internationally operating participant base and pricing does not differ depending on the customer's location. From a price, margin and risk perspective, this means that it is not decisive whether sales revenue is generated from German or non-German participants.

The risks and returns from the activities of the subsidiaries operating within the economic environment of the European Monetary Union (EMU) do not differ significantly from each other on the basis of the factors to be considered in identifying information on geographical regions under IFRS 8. As a result, Deutsche Börse Group has designated the following regional segments: the eurozone, the rest of Europe, America and Asia-Pacific.

Sales revenue is allocated to the individual regions according to the customer's domicile, while investments and non-current assets are allocated according to the company's domicile and employees according to their location.

As described above, the analysis of sales is based on the direct customer's billing address. This means e.g. that sales to an American investor trading a product with an Asian underlying via a European clearing member are classified as European sales.

Information on geographical regions

	Sales revenue ¹⁾		Investments ²⁾		Non-current non-financial assets ^{3) 4)}		Number of employees	
	2019 €m	2018 ⁵⁾ €m	2019 €m	2018 €m	2019 €m	2018 €m	2019	2018
Euro zone	1,718.1	1,491.2	176.1	154.7	4,043.4	3,636.2	4,721	4,425
Rest of Europe	999.2	1,121.8	3.7	3.7	455.1	512.7	1,360	1,154
America	231.5	199.2	4.8	1.5	1,029.9	213.2	411	184
Asia-Pacific	168.5	147.2	0.1	0.1	22.5	2.9	283	201
Total of all regions	3,117.3	2,959.4	184.7	160.0	5,550.9	4,365.0	6,775	5,964
Consolidation of internal net revenue	-63.1	-60.2						
Group	3,054.2	2,899.2	184.7	160.0	5,550.9	4,365.0	6,775	5,964

1) Including countries in which more than 10 per cent of sales revenue was generated: UK (2019: €704.2 million, 2018: €887.4 million) and Germany (2019: €769.6 million, 2018: €655.0 million)

2) Excluding goodwill and right-of-use assets from leasing

3) Including countries in which more than 10 per cent of assets are held: Germany (2019: €3,634.1 million, 2018: €3,439.2 million) and United States (2019: €1,029.9 million, 2018: €213.2 million)

4) These include intangible assets, property, plant and equipment, and investments in associates and joint ventures

5) Prior year adjusted

23. Financial risk management

Deutsche Börse Group presents the qualitative disclosures required by IFRS 7 in detail in the combined management report (see explanations in the [risk report](#)). These include the nature and extent of risks arising from financial instruments, as well as the objectives, strategies and methods used to manage risk.

Financial risks arise at Deutsche Börse Group mainly in the form of credit risk. To a smaller extent, the Group is exposed to market risk. Financial risks are quantified using the economic capital concept (please refer to the [risk report](#) for detailed disclosures). Required economic capital is assessed on a 99.98 per cent confidence level for a one-year holding period. It is compared with the Group's liable equity capital adjusted for intangible assets so as to test the Group's ability to absorb extreme and unexpected losses. Required economic capital (REC) for financial risk is calculated at the end of each month and amounted to €627.0 million as at 31 December 2019, whereby €510.0 million stem from credit risk and €117.0 million stem from market risk.

The Group evaluates its financial risk situation on an ongoing basis. In the view of the Executive Board, no threat to the continued existence of the Group can be identified at this time.

Credit risk**Credit risk of financial instruments (part 1)**

	Segment	Note	Carrying amounts – maximum risk exposure		Collateral	
			Amount at 31 Dec 2019 €m	Amount at 31 Dec 2018 €m	Amount at 31 Dec 2019 €m	Amount at 31 Dec 2018 €m
Collateralised cash investments						
Reverse repurchase agreements	Eurex (financial derivatives) ¹¹⁾		91.2	49.7	100.8 ²⁾	53.7
	Clearstream (post-trading)	13.2	6,394.3	6,516.2	6,552.2 ³⁾⁴⁾	6,616.7 ^{3) 4)}
	Group ¹¹⁾		0	410.0	0	411.0
			6,485.5	6,975.9	6,653.0	7,081.4
Uncollateralised cash investments						
Money market lendings – central banks	Eurex (financial derivatives)		26,038.8	24,287.9 ¹¹⁾	0	0
	Clearstream (post-trading)		5,998.6	5,974.7	0	0
	EEX (commodities)		3,989.7	5,571.8 ¹¹⁾	0	0
Money market lendings – other counterparties	Clearstream (post-trading)		437.2	556.7	0	0
Balances on nostro accounts and other bank deposits	Clearstream (post-trading)		1,604.5	2,252.5	0	0
	Group		748.7	733.3	0	0
Securities	Clearstream (post-trading)	13.2	1,266.9	1,610.0	0	0
	Eurex (financial derivatives)	13.2	4.2	9.4	0	0
	Group	13.2	14.0 ⁵⁾	5.1 ⁵⁾	0	0
Fund assets	Group	13.5	28.4	14.6	0	0
			40,131.0	41,016.0	0	0
Loans for settling securities transactions						
Technical overdraft facilities	Clearstream (post-trading)	13.2	231.7	2,253.3	n.a. ⁶⁾	n.a. ⁶⁾
Automated Securities Fails Financing ⁷⁾	Clearstream (GSF)		288.8 ⁸⁾	413.2 ⁸⁾	316.6	448.4
ASLplus securities lending ⁷⁾	Clearstream (GSF)		58,008.6	42,558.3	58,228.6	42,693.7
			58,529.1	45,224.8	58,545.2	43,142.1
Total			105,145.6	93,216.7	65,198.2	50,223.5

Credit risk of financial instruments (part 2)

	Segment	Note	Carrying amounts – maximum risk exposure		Collateral	
			Amount at 31 Dec 2019 €m	Amount at 31 Dec 2018 €m	Amount at 31 Dec 2019 €m	Amount at 31 Dec 2018 €m
Balance brought forward			105,145.6	93,216.6	65,198.2	50,223.5
Other financial instruments						
Convertible notes	Group	13.5	0	2.7	0	0
Other loans	Group		0.3	0.4	0	0
Other assets	Group		23.7	23.7	0	0
Trade receivables	Group	13.2	454.4	403.2	0	0
Other receivables	Clearstream (post-trading)		43.1	57.7	0	0
	Eurex (financial derivatives)	13.2	48.4	1,608.9	0	0
	Group		21.6	14.4	0	0
Other instruments at fair value	Group	13.2	0.4	0.4	0	0
			591.9	2,111.4	0	0
Financial instruments held by central counterparties			52,889.4⁹⁾	47,969.5⁹⁾	66,680.9¹⁰⁾	61,752.1¹⁰⁾
Derivatives		13.5	1.4	4.7	0	0
Total			158,628.3	143,302.2	131,879.1	111,975.6

- 1) Presented in the items "restricted bank balances" and "other cash and bank balances"
- 2) Thereof none pledged to central banks (2018: nil)
- 3) Thereof €274.0 million pledged to central banks (2018: €162.7 million)
- 4) Total of fair value of cash (2019: nil; 2018: nil) and securities collateral (2019: €6,552.2 million; 2018: €6,616.7 million) received under reverse repurchase agreements
- 5) The amount includes collateral totalling €5.1 million (2018: €5.1 million)
- 6) The portfolio of deposited collateral is not directly attributed to any utilisation, but is determined by the scope of the entire business relationship and the limits granted.
- 7) Off-balance-sheet items
- 8) Meets the IFRS 9 criteria for a financial guarantee contract
- 9) Net value of all margin requirements resulting from executed trades at the reporting date as well as default fund requirements: this figure represents the risk-oriented view of Eurex Clearing AG and European Commodity Clearing AG, while the carrying amount of the "financial instruments held by central counterparties" item in the balance sheet shows the gross amount of the open trades according to IAS 32.
- 10) Collateral value of cash and securities collateral deposited for margins, covering the net value of all margin and default fund requirements
- 11) Prior year figures adjusted

Cash investments

Deutsche Börse Group is exposed to credit risk in connection with the investment of cash funds. Clearstream receives cash deposits from its customers in various currencies, and invests these cash deposits in money market instruments. Eurex Clearing AG receives cash collateral mainly in its clearing currencies EUR and CHF.

The Group mitigates such risks by investing short-term funds either – to the extent possible – on a collateralised basis, e.g. via reverse repurchase agreements, or by depositing them with central banks.

According to the treasury policy, mainly highly liquid financial instruments with a minimum rating of AA– (Standard & Poor’s/Fitch) or Aa3 (Moody’s) issued or guaranteed by governments or supranational institutions are eligible as collateral.

Uncollateralised cash investments are permitted only with counterparties with sound creditworthiness within the framework of defined counterparty credit limits. Counterparty credit risk is monitored on the basis of an internal rating system.

The fair value of securities received under reverse repurchase agreements was €6,653.0 million (2018: €7,081.4 million). Clearstream Banking S.A. and Eurex Clearing AG are entitled to pledge the eligible securities received to their central banks to regain liquidity.

As at 31 December 2019, Clearstream S.A. has pledged securities with a value of €476.7 million to central banks. Of this, securities with a value of €274.0 million relate to reverse repurchase agreements (2018: €162.7 million) and €202.7 million (2018: €1,205.7 million) stem from Clearstream’s investment portfolio.

As at 31 December 2019, Eurex Clearing AG has pledged no securities to central banks.

Loans for settling securities transactions

Clearstream (post-trading) grants customers intraday technical overdraft facilities to maximise settlement efficiency. These settlement facilities are subject to internal credit review procedures. They are revocable at the option of the Clearstream subgroup and are in general fully collateralised. Technical overdraft facilities amounted to €115.5 billion as at 31 December 2019 (2018: €115.2 billion). Of this amount, €3.4 billion (2018: €3.3 billion) is unsecured and only relates to credit lines granted to selected central banks and multilateral development banks in compliance with the CSDR exemption as per article 23 of Commission Delegated Regulation (EU) 2017/390. Actual outstandings at the end of each business day generally represent a small fraction of the facilities and amounted to €231.7 million as at 31 December 2019 (2018: €2,253.3 million); see [note 13.2](#).

Clearstream (GSF, collateral management) also guarantees the risk resulting from the Automated Securities Fails Financing programme it offers to its customers, where Clearstream Banking S.A. acts as an intermediary between borrower and lender. This risk is collateralised. Guarantees given under this programme amounted to €288.8 million as at 31 December 2019 (2018: €413.2 million). Collateral received by Clearstream Banking S.A. in connection with these loans amounted to €316.6 million (2018: €448.4 million).

Under the ASLplus securities lending programme, Clearstream Banking S.A. had securities borrowings from various counterparties totalling €58,008.6 million as at 31 December 2019 (2018: €42,558.3 million). These securities were fully lent to other counterparties. Collateral received by Clearstream Banking S.A. in connection with these loans amounted to €58,228.6 million (2018: €42,693.7 million). This collateral was pledged to the lender, while Clearstream Banking S.A. remains its legal owner.

In 2018 and 2019, no losses from credit transactions occurred in relation to any of the transaction types described.

Financial instruments of the central counterparties

To safeguard the Group's central counterparties against the risk of default by a clearing member, the clearing conditions require the clearing members to deposit margins in the form of cash or securities on a daily basis or an intraday basis in the amount stipulated by the respective clearing house. Additional safety mechanisms of the Group's central counterparties are described in detail in the [risk report](#).

Trade receivables

Trading, settlement and custody fees are generally collected without delay by direct debit. Fees for other services, such as the provision of data and information, are settled mainly by transfer. Trade receivables are analysed using an expected credit loss model based on the simplified approach as outlined in IFRS 9. To measure the expected credit loss, trade receivables and contract assets have been grouped based on the days past due. The trade receivables share the main risk characteristics. The expected loss amount has been determined by applying the lifetime expected loss approach. The expected loss rates are based on the payment profiles over a period of five years and the loss profile experienced over that period.

Loss allowances for trade receivables as at 31 December 2019

	Not more than 30 days past due €m	Not more than 60 days past due €m	Not more than 90 days past due €m	Not more than 120 days past due €m	Not more than 360 days past due €m	More than 360 days past due €m	Insolvent €m	Total €m
Expected loss rate	0.0%	0.0%	0.0%	1.0%	5.0%	82.0%	0,0%	
Trade Receivables	24.6	13.4	5.8	4.4	19.9	5.7	1.3	75.1
Loss allowance	0.0	0.0	0.0	0.1	1.1	4.7	1.3	7.1

Loss allowances for trade receivables as at 31st December 2018

	Not more than 30 days past due €m	More than 30 days past due €m	More than 60 days past due €m	More than 90 days past due €m	More than 120 days past due €m	More than 360 days past due €m	Insolvent €m	Total €m
Expected loss rate	0.0%	0.0%	0.0%	0.0%	5.0%	82.0%	0,0%	
Trade Receivables	30.5	12.4	7.1	3.2	15.0	4.3	1.3	73.8
Loss allowance	0	0.1	0	0	0.8	3.5	1.3	5.7

Trade receivables are written off when there is no reasonable expectation of recovery. In 2019, no significant receivables (31 December 2018: nil) were uncollectible due to customer defaults. Moreover, no significant payments were received in 2019 for receivables which had previously been written off (2018: €0.1 million).

Debt securities

All of the entity's debt securities measured at amortised cost are considered to have low credit risk, and the loss allowance recognised during the period was therefore limited to twelve months' expected losses. The Group considers "low credit risk" for listed bonds to be an investment grade credit rating granted by an external rating agency. The expected loss is calculated based on a loss rate approach derived from default rates provided by a rating agency.

Development of the loss allowance

	Debt securities Stage 1 €m	Trade receivables Stage 1/2 €m	Trade receivables Stage 3 €m	Total €m
Closing loss allowance as at 1 January 2018	0.3	0.5	3.2	4.0
Increase in the allowance recognized in profit or loss during the period	0	0.5	1.8	2.3
Decrease in the allowance recognized in profit or loss during the period	-0.2	-0.1	-0.2	-0.5
Closing loss allowance as at 31 December 2018	0.1	0.9	4.8	5.8
Increase in the allowance recognized in profit or loss during the period	0	0.6	1.8	2.4
Decrease in the allowance recognised in profit or loss during the period	0	-0.4	-0.6	-1.0
Closing loss allowance as at 31 December 2019	0	1.1	6.0	7.1

Credit risk concentrations

Deutsche Börse Group's business model and the resulting business relationships mean that, as a rule, credit risk is concentrated on the financial services sector. Potential concentrations of credit risk are limited by application of counterparty, group and country credit limits. Collateral and currency concentrations are also monitored.

Management of credit risk concentration, including collateral concentration, and so-called large exposures, is conducted in compliance with applicable regulatory requirements such as those arising from, among others, articles 387–410 of Regulation (EU) 575/2013 (Capital Requirements Regulation, CRR), article 47 paragraph 8 of Regulation (EU) 648/2012 (European Market Infrastructure Regulation, EMIR) and respectively applicable national requirements (see also [note 15](#) for an explanation of regulatory capital requirements). Requirements on concentration risks arising from Regulation (EU) 909/2014 (Central Securities Depository Regulation, CSDR) have been implemented as part of Deutsche Börse Group's affiliated CSDs' authorisation under article 16 CSDR.

The required economic capital (value at risk (VaR) with a 99.98 per cent confidence level) for credit risk is calculated monthly for each day and amounted to €510.0 million as at 31 December 2019 (2018: €517.0 million).

Deutsche Börse Group also applies additional methods in order to detect credit concentration risks. In 2019, no significant adverse credit concentrations were assessed.

Market risk

Market risk arises from changes in interest rates, foreign-exchange rates and other market prices. Deutsche Börse Group is generally only affected to a limited extent by market risk. The required economic capital for market risk is calculated on a monthly basis. As at 31 December 2019, the required economic capital for market risk was €117.0 million (2018: €84.0 million).

In the 2019 financial year, no impairment losses (2018: €0.6 million) were recognised in profit or loss for strategic investments that are not included in the VaR for market risk.

Interest rate risk

Changes in market interest rates may affect Deutsche Börse Group's net profit for the period attributable to Deutsche Börse AG shareholders. This risk arises whenever interest terms of financial assets and liabilities are different.

Interest rate sensitive assets include the Group's money market and investment portfolios, while interest rate sensitive liabilities mainly consist of short-term debt instruments. Interest rate risk from long-term liabilities of Deutsche Börse AG is mitigated through issuance of fixed-coupon bonds.

In 2019, Deutsche Börse AG did not issue any bonds to refinance long-term indebtedness. For an overview on details of all bonds issued before 2019 by Deutsche Börse Group, see the ["Net assets" section in the combined management report](#).

Cash received as deposits from market participants is mainly invested via short-term reverse repurchase agreements and in the form of overnight deposits at central banks, limiting the risk of a negative impact due to a changed interest rate environment. Negative interest rates resulting from reinvestments of these cash deposits are passed on to the respective Clearstream (post-trading) customers after applying an additional margin. For Eurex Clearing AG, interest rates on cash collateral are in principle calculated based on a predefined market benchmark rate per currency after deducting an additional spread per currency. In exceptional cases such as market disruption Eurex Clearing AG reserves the right to calculate interest rates on cash collateral based on the realised interest rate.

Group entities may furthermore invest their own capital and part of stable customer cash balances in high-quality liquid bonds. The bond portfolio consists mostly of variable-rate instruments, which leads to a comparably low interest rate risk for the Group.

The risk arising from interest-earning assets and interest-bearing liabilities is monitored on each business day and limited by using a system which includes mismatch limits in combination with interest rate risk limits and stop-loss limits. The interest rate risk limits determine the acceptable maximum loss caused by a hypothetical adverse yield curve shift. The stop-loss limits define the fair value of a portfolio triggering an ad hoc review and risk-reducing actions.

Interest rate swaps as well as swaptions are used to hedge interest rate risks. As of the reporting date, there are no hedging relationships with regards to interest rate risk in place.

Foreign-exchange rate risk

Measuring and managing foreign-exchange risk is important for reducing Deutsche Börse Group's exposure to exchange rate movements. The three main types of foreign-exchange risk that Deutsche Börse Group is exposed to are cash flow-, translation- and transaction-related foreign-exchange risk. Cash flow risk reflects the risk of fluctuations in Deutsche Börse Group's present value of future operating cash flows from foreign-exchange movements. Translation risk comprises effects from the valuation of the Group's assets and liabilities in foreign currencies. Finally, transaction risk is closely related to cash flow risk; it may arise through changes in the structure of Deutsche Börse Group's asset and liabilities in foreign currencies.

The Group operates internationally and is, to a limited extent, exposed to foreign-exchange risk, primarily in US\$, CHF, £ and CZK. Exchange rate fluctuations may affect the Group's profit margins and the value of assets and liabilities denominated in a currency that is not the functional currency of the relevant Group entity. Respective currency risks arise mainly from operating income and expenses denominated in a currency other than the functional currency, inter alia from that portion of the Clearstream (post-trading) segment's sales revenue and net interest income from banking business that is directly or indirectly in US\$. The Clearstream (post-trading) segment generated 20 per cent of its sales revenue and net interest income (2018: 21 per cent) directly or indirectly in US\$.

Currency mismatches are avoided to the maximum extent possible. All types of foreign-exchange risks are measured on a regular basis and monitored on a Group as well as single entity level. Limits are defined for cash flow and translation risk affecting the Group's income statement. Deutsche Börse Group's treasury policy defines risk limits which take into account historic foreign-exchange rate fluctuations. Any exposure exceeding those limits must be hedged. Foreign-exchange exposures below the defined limits may also be hedged. Management of foreign-exchange risks is in principle based on the Group level. Hedging on a single entity level may be conducted if foreign-exchange risk threatens the viability of the single entity.

To eliminate foreign-exchange risks, Deutsche Börse Group uses financial instruments to hedge existing or highly probable forecast transactions. The Group may use foreign-exchange forwards, foreign-exchange options as well as cross-currency swaps to hedge the exposure to foreign-exchange risk. Under the Group's policy, the critical terms of forwards and options must align with the hedged items.

In addition, for Clearstream (post-trading), the policy stipulates that intraperiod open net foreign-exchange positions are closed out when they exceed €15.0 million. This policy was complied with, as in the previous year; as at 31 December 2019, there were no significant net foreign-exchange positions.

Other market risks

Moreover, market risk arises from investments in bonds, investments in funds, futures within the framework of contractual trust arrangements (CTAs) and from the Clearstream Pension Fund in Luxembourg. For the CTAs, the investment is protected by a pre-defined floor, which reduces the risk of extreme losses for Deutsche Börse Group. In addition, there are equity price risks arising from strategic equity investments.

Liquidity risk

For the Group, liquidity risk may arise from potential difficulties in renewing maturing financing, such as commercial paper, issued bonds as well as bilateral and syndicated credit facilities. In addition, financing required for unexpected events may result in a liquidity risk. Most of the Group's cash investments are short-term to ensure that liquidity is available, should such a financing need arise. Eurex Clearing AG and Clearstream may invest stable customer balances up to a maximum of one year in secured money market products, or in high-quality securities with a remaining maturity of less than ten years, with an exception for UK gilts accepting a maximum remaining life to maturity of 30 years, subject to strict monitoring of mismatch and interest rate limits. Term investments can be transacted via reverse repurchase agreements against highly liquid collateral that can be deposited with the central bank and used as a liquidity buffer if required. Eurex Clearing AG remains almost perfectly matched with respect to the durations of customer cash margins received and respective investments.

The companies of Deutsche Börse Group have the following credit lines at their disposal, which were not utilized as of the balance sheet date.

Contractually agreed credit lines

Company	Purpose of credit line	Currency	Amount at 31 Dec 2019 m	Amount at 31 Dec 2018 m
Deutsche Börse AG	working capital ¹⁾	€	605.0	605.0
Eurex Clearing AG	settlement	€	1,170.0	1,170.0
	settlement	CHF	200.0	200.0
	settlement ²⁾	USD	150.0	0.0
Clearstream Banking S.A.	working capital ¹⁾	€	750.0	750.0
	Settlement ²⁾	€	1,250.0	500.0
	Settlement ²⁾	USD	3,050.0	1,425.0
	Settlement ²⁾	GBP	350.0	500.0
European Energy Exchange AG	working capital	€	22.0	20.0
European Commodity Clearing AG	settlement	GBP	1.0	1.0
Axioma Inc.	working capital	USD	50.0	-

1) €400.0 million of Deutsche Börse AG's working capital credit lines is a sub-credit line of Clearstream Banking S.A.'s €750.0 million working capital credit line.

2) Including committed foreign exchange swap lines and committed repo lines.

For refinancing purposes, Eurex Clearing AG and the Clearstream Banking S.A. can pledge eligible securities with their respective central banks. Clearstream Banking S.A. has a bank guarantee (letter of credit) in favour of Euroclear Bank S.A./N.V. issued by an international consortium to secure daily deliveries of securities between Euroclear Bank S.A./N.V. and Clearstream Banking S.A. This guarantee amounted to US\$3.0 billion as at 31 December 2019 (2018: US\$3.0 billion). Euroclear Bank S.A./N.V. has also issued a guarantee in favour of Clearstream Banking S.A. amounting to US\$3.0 billion (2018: US\$3.0 billion).

A commercial paper programme offers Deutsche Börse AG an opportunity for flexible, short-term financing, involving a total facility of €2.5 billion in various currencies. As at year-end, there was no commercial paper outstanding (2018: nil).

Clearstream Banking S.A. also has a commercial paper programme with a programme limit of €1.0 billion, which is used to provide additional short-term liquidity. As at 31 December 2019, commercial paper with a nominal value of €311.9 million had been issued (2018: €402.1 million).

In 2019, Standard & Poor’s confirmed Deutsche Börse AG’s AA credit rating with a stable outlook. At the end of 2019, Deutsche Börse AG was one of only two DAX-listed companies that had been given an AA rating by Standard & Poor’s. Deutsche Börse AG’s commercial paper programme was awarded the best possible short-term rating of A–1+. The AA rating of Clearstream Banking S.A. was confirmed with a stable outlook by the rating agencies Fitch and Standard & Poor’s in 2019. For further details on the rating of Deutsche Börse Group, see the [“Financial position” section in the combined management report](#).

Maturity analysis of financial instruments (1)

	Contractual maturity					Reconcilia- tion to carrying amount €m	Carrying amount €m
	Sight €m	Not more than 3 months €m	More than 3 months but not more than 1 year €m	More than 1 year but not more than 5 years €m	Over 5 years €m		
31.12. 2019							
Non-derivative financial liabilities							
Non-current financial liabilities measured at amortised cost	0	0	45.6	1,457.8	1,362.2	-238.4	2,627.2
Thereof: Lease liabilities	0	0	0	153.3	227.2	-39.4	341.0
Non-current financial liabilities at fair value through profit or loss	0	0	0	84.3	0	0	84.3
Trade payables	0.4	204.0	0.7	0	0	1.6	206.7
Current financial liabilities measured at amortised cost	13,826.3	63.7	335.1	0	0	0,3	14,225.4
Thereof: Lease liabilities	0	11.6	33.9	0	0	-6.4	39.1
Financial liabilities measured at fair value	3.6	0	0	0	0	0	3.6
Cash deposits by market participants	29,751.1	4.7	0	0	0	0	29,775.8
Total non-derivative financial liabilities (gross)	43,581.4	272.4	381.4	1,542.1	1,362.2	-236.5	46,903.0
Derivatives and financial instruments held by central counterparties							
Financial liabilities and derivatives held by central counterparties	11,220.4	59,271.0	6,920.1	4,176.5	1,057.7	0	82,645.7
less financial assets and derivatives held by central counterparties	-11,220.4	-60,161.0	-6,920.1	-4,176.5	-1,057.7	0	-83,535.7
Cash inflow - derivatives and hedges							
Cash flow hedges	0	-16.0	-79.3	0	0		
Fair value hedges	0	0	0	0	0		
Derivatives held for trading	-829.6	-75.7	-2,171.0	0	0		
Cash outflow - derivatives and hedges							
Cash flow hedges	0	16.0	80.3	0	0		
Derivatives held for trading	828.2	75.9	2,172.2	0	0		
Total derivatives and hedges	-1.4	-889.9	2.2	0	0		
Financial guarantee contracts	0	0	0	0	0		

Maturity analysis of financial instruments (2)

	Contractual maturity					Reconciliation to carrying amount €m	Carrying amount €m
	Sight €m	Not more than 3 months €m	More than 3 months but not more than 1 year €m	More than 1 year but not more than 5 years €m	Over 5 years €m		
31.12. 2018							
Non-derivative financial liabilities							
Interest-bearing liabilities	0	0	0	1,335.3	1,150.0	-202.1	2,283.2
Other non-current financial liabilities	0	0	0	0.2	0	0	0.2
Non-derivative liabilities from banking issues	0	195.0	0	0	0	0	195.0
Payables to associates	0	0	0	0	0	0	0.0
Trade payables, payables to related parties and other current liabilities	18,566.3	203.9	270.9	0	0	-16.4	19,024.7
Other bank loans overdrafts	29,559.2	0	0	0	0	0	29,559.2
Total non-derivative financial liabilities (gross)	48,125.5	398.9	270.9	1,335.5	1,150.0	-218.5	51,062.3
Derivatives and financial instruments held by central counterparties							
Financial liabilities and derivatives held by central counterparties	26,256.3	54,796.6	13,015.4	7,347.1	2,638.3	0	104,053.7
less financial assets and derivatives held by central counterparties	-26,256.3	-55,008.6	-13,015.4	-7,347.1	-2,638.3	0	-104,265.7
Cash inflow - derivatives and hedges							
Cash flow hedges	0	0	0	0	0		
Fair value hedges	0	0	0	0	0		
Derivatives held for trading	-1,592.6	-137.1	-1,642.4	0	0		
Cash outflow - derivatives and hedges							
Cash flow hedges	0	0	0	0	0		
Fair value hedges	0	0	0	0	0		
Derivatives held for trading	1,592.4	136.9	1,662.7	0	0		
Total derivatives and hedges	-0.2	-212.2	20.3	0	0		
Financial guarantee contracts	0	0	0	0	0		

24. Financial liabilities and other risks

Legal risks

The companies of Deutsche Börse Group are subject to litigation. Such litigation may lead to orders to pay against the entities of the Group. If it is more likely than not that an outflow of resources will occur, a provision will be recognised based on an estimate of the most probable amount necessary to settle the obligation if such amount is reasonably estimable. The management of the entity affected must judge whether the possible obligation results from a past event, as well as evaluate the probability of a cash outflow and estimate its amount. As the outcome of litigation is usually uncertain, the judgement is reviewed continuously.

Deutsche Börse Group recognises provisions for the possible incurrence of losses only if there is a present obligation arising from a past event that is likely to result in an outflow of resources and if the Group can reliably estimate the amount of the obligation (see also [note 18](#)). Contingent liabilities may result from present obligations and from possible obligations arising from events in the past. In order to identify the litigation for which the possibility of incurring a loss is more than unlikely, as well as how the possible loss is estimated, Deutsche Börse Group considers a large number of factors, including the nature of the claim and the facts on which it is based, the jurisdiction and course of the individual proceedings, the experience of Deutsche Börse Group, prior settlement talks (to the extent that they already taken place) as well as expert opinions and evaluations of legal advisors. However, it is also possible that no reliable estimate for a specific litigation could be determined before the approval of the consolidated financial statements, and that – as a result – no provisions are recognised. The companies of Deutsche Börse Group are subject to litigation; as the outcome of litigation is usually uncertain, the judgement is reviewed continuously.

Deutsche Börse Group presents further details of litigation risks in the combined management report (see explanations in the [risk report](#)).

Tax risks

Due to its business activities in various countries, Deutsche Börse Group is exposed to tax risks. A process has been developed to recognise and evaluate these risks, which are initially recognised based on their probability of occurrence. These risks are then measured on the basis of their expected value. A tax liability is recognised in the event that it is more probable than not that the risks will occur. Deutsche Börse Group continuously reviews whether the conditions for recognising corresponding tax liabilities are met.

25. Share-based payment

Deutsche Börse Group operates the Group Share Plan (GSP), the Stock Bonus Plan (SBP), the Co-Performance Investment Plan (CPIP) and the Performance Share Plan (PSP) as well as the Long-term Sustainable Instrument (LSI) and the Restricted Stock Units (RSU), which provide share-based payment components for employees, senior executives and executive board members.

Stock Bonus Plan (SBP)

The SBP is open to senior executives of Deutsche Börse AG and its participating subsidiaries. It grants a long-term remuneration component in the form of so-called SBP shares. These are generally accounted for as share-based payments for which Deutsche Börse AG has a choice of settlement in cash or equity instruments for certain tranches. Tranches due in previous years were each settled in cash. In the reporting period, the company established an additional tranche of the SBP for senior executives who are not risk takers. In order to participate in the SBP, a beneficiary must have earned a bonus. The awards are settled in cash and the SBP shares are measured as cash-settled share-based payment transactions. The cost of the options is estimated using an option pricing model (fair value measurement) and recognised in staff costs in the consolidated income statement.

The number of stock options is determined by the amount of the individual and performance-based SBP bonus for the financial year, divided by the average share price (Xetra closing price) of Deutsche Börse AG's shares in the fourth quarter of the financial year in question. Neither the converted SBP bonus nor the stock options are paid at the time the bonus is determined. Rather, the entitlement is generally received three years after the grant date (the "waiting period"). Within this period, beneficiaries cannot assert shareholder rights (in particular, the rights to receive dividends and attend the Annual General Meeting). Once they have met the condition of service, the beneficiaries' claims resulting from the SBP are calculated on the first trading day following the last day of the waiting period. The current market price at that date (closing auction price of Deutsche Börse shares in electronic trading on the Frankfurt Stock Exchange) is multiplied by the number of stock options. Stock options are settled in cash.

Evaluation of the SBP

The company uses an adjusted Black-Scholes model (Merton model) to calculate the fair value of the stock options.

Valuation parameters for SBP shares

		Tranche 2019	Tranche 2018	Tranche 2017	Tranche 2016
Term to		31/03/2023	31/03/2022	28/02/2021	29/02/2020
Risk-free interest rate	%	- 0.54	- 0.58	- 0.63	- 0.72
Volatility of Deutsche Börse AG shares	%	18.28	18.67	19.12	16.63
Dividend yield	%	1.93	1.93	0.96	0,00
Exercise price	€	0	0	0	0

The valuation model does not take into account exercise hurdles. The volatilities applied correspond to the market volatilities of comparable options with comparable maturities.

Valuation of SBP shares

Tranche	Balance at 31 Dec 2019 Number	Deutsche Börse AG share price at 31 Dec 2019 €	Intrinsic value/ option at 31 Dec 2019 €	Fair value/ option at 31 Dec 2019 €	Settlement obligation €m	Current provision at 31 Dec 2019 €m	Non-current provision at 31 Dec 2019 €m
2016 ¹⁾	15,217	140.15	140.15	134.53	2.0	2.0	0
2017	12,660	140.15	140.15	99.78	1.3	0	1.3
2018	11,782	140.15	140.15	63.18	0.7	0	0.7
2019 ²⁾	8,403	140.15	140.15	30.99	0.3	0	0.3
Total	48,062				4.3	2.0	2.3

1) The number of stock options, settlement obligation, and short-term provision of the 2016 tranche includes the unsettled shares of the 2015 tranche

2) Given that the 2019 SBP tranche stock options for senior executives will not be granted until the 2020 financial year, the number of shares applicable as at the reporting date may be adjusted during the 2020 financial year

Average price of the exercised and forfeited share options

Tranche	Average price of the exercised share options €	Average price of the forfeited share options €
2015	113.97	0.00
2016	117.00	122.96
2017	120.25	88.85
2018	136.55	51.14

The stock options from the 2015 SBP tranche were exercised in the reporting period following the expiration of the waiting period. Shares of the SBP tranches 2016, 2017 and 2018 were paid to former employees as part of severance payments in the year under review.

The carrying amount of the provision for the SBP results from the measurement of the number of SBP stock options at the fair value of the closing auction price of Deutsche Börse shares in electronic trading at the Frankfurt Stock Exchange at the reporting date and its proportionate recognition over the waiting period.

Provisions for the SBP amounting to €4.3 million were recognised at the reporting date of 31 December 2019 (31 December 2018: €3.5 million). The total expense for LSI stock options in the reporting period amounted to €2.6 million (2018: €2.1 million).

Change in number of SBP shares allocated

	Balance at 31 Dec 2018	Disposals Tranche 2016	Disposals Tranche 2017	Disposals Tranche 2018	Additions Tranche 2019	Fully settled cash options	Options forfeited	Balance at 31 Dec 2019
To other senior executives	57,392	0	0	-772	8,403	-16,120	-841	48,062
Total	57,392	0	0	-772	8,403	-16,120	-841	48,062

Long-term Sustainable Instrument (LSI) and Restricted Stock Units (RSU)

In 2014, Deutsche Börse Group introduced the Long-Term Sustainable Instrument (LSI) plan in order to provide share-based remuneration in line with regulatory requirements. This programme was extended in 2016 with the Restricted Stock Units (RSU) plan. The following disclosures relate to both plans.

Long-term Sustainable Instrument (LSI)

The LSI remuneration model requires at least half of a part of the variable remuneration to be settled in cash and half in phantom shares of Deutsche Börse AG (LSI shares). All tranches will be settled in cash. A portion of the variable remuneration is paid in the subsequent year and another portion over a further period of three or four years. Moreover, a portion of the variable remuneration shall be converted into RSU, subject to a three-year retention period after grant and a one-year waiting period (RSU shares). Deutsche Börse Group thus measures the LSI shares as cash-settled share-based payment transactions. The options are measured using an option pricing model (fair value measurement). Any right to payment of a stock bonus only vests after the expiration of the one-year service period on which the plan is based, taking certain waiting periods into account.

The number of LSI and RSU shares for the 2015 to 2018 tranches is calculated by dividing the proportionate LSI or RSU bonus, respectively, for the year in question by the average closing price of Deutsche Börse AG shares in the last month of a financial year. The number of LSI and RSU shares for the 2019 tranche is based on the closing auction price of Deutsche Börse shares as at the disbursement date of the cash component of the 2019 tranche in 2020, or on the closing price as at the following trading day on the Frankfurt Stock Exchange. This results in individual LSI tranches for the LSI bonus, which have maturities of between one and eight years. The RSU bonus is used as a basis for another four-year tranche. Payment of each tranche is made after a waiting period of one year. Neither remuneration system stipulates any condition of service. Following the expiry of the waiting period, both the LSI and the RSU shares of the 2015 to 2018 tranches are measured on the basis of the average closing price of Deutsche Börse AG shares in the last month preceding the end of the waiting period. The LSI and RSU shares of the 2019 tranche are measured at the closing auction price as at the first trading day in February of the year in which the holding period ends.

Restricted Stock Units (RSU)

Like the LSI plan, the RSU plan applies to risk takers within Deutsche Börse Group. RSU shares are settled in cash; Deutsche Börse Group thus measures the RSU shares as cash-settled share-based payment transactions. The options are measured using an option pricing model (fair value measurement). Any right to payment of a stock bonus only vests after the expiration of the one-year service period on which the plan is based, taking a three-year retention period and a one-year waiting period into account.

Evaluation of the LSI and the RSU

The company uses an adjusted Black-Scholes model (Merton model) to calculate the fair value of the LSI and RSU stock options.

Valuation parameters for LSI and RSU shares

	Tranche 2019	Tranche 2018	Tranche 2017	Tranche 2016	Tranche 2015	Tranche 2014
						31.12.2019
Term to	31.12.2020 to 31.12.2028	31.12.2019 to 31.12.2025	31.12.2019 to 31.12.2022	31.12.2019 to 31.12.2021	31.12.2019 to 31.12.2020	31.12.2019 to 31.12.2020
Risk-free interest rate	% -0.66 to -0.61	-0.66 to -0.64	-0.66	-0.66 to -0.64	-0.64	-0.62
Volatility of Deutsche Börse AG shares	% 18.10 to 21.68	18.10 to 19.80	18.10 to 18.92	18.10	18,10	0
Dividend yield	% 1.93	0 to 1.93	0 to 1.93	0 to 1.93	0 to 1.93	0 to 1.93
Exercise price	€ 0	0	0	0	0	0

The valuation model does not take into account exercise hurdles. The volatilities applied correspond to the market volatilities of comparable options with comparable maturities.

Valuation of LSI and RSU shares

Tranche	Balance as at 31 Dec 2019 Number	Deutsche Börse AG share price as at 31 Dec 2019 €	Intrinsic value/ option as at 31 Dec 2019 €	Fair value/ option as at 31 Dec 2019 €	Settlement obligation €m	Current provision as at 31 Dec 2019 €m	Non-current provision as at 31 Dec 2019 €m
2014	2,037	140.15	140.15	138.48	0.3	0.3	0
2015	7,849	140.15	140.15	137.49 – 138.48	1.1	0.9	0.2
2016	58,719	140.15	140.15	134.89 – 138.48	8.0	1.2	6.8
2017	57,648	140.15	140.15	132.34 – 138.48	7.8	1.0	6.8
2018	76,181	140.15	140.15	129.84 – 138.48	10.3	2.7	7.6
2019	42,470	140.15	140.15	127.39 – 137.49	5.6	0	5.6
Total	244,904				33.1	6.1	27.0

Provisions amounting to €33.1 million were recognised as at 31 December 2019 (31 December 2018: €26.5 million). The total expense for LSI stock options in the reporting period amounted to €10.9 million (31 December 2018: €10.1 million).

Change in number of LSI and RSU shares allocated

	Balance at 31 Dec 2018	Disposals Tranche 2014	Disposals Tranche 2015	Disposals Tranche 2016	Disposals Tranche 2017	Disposals Tranche 2018	Additions Tranche 2019	Fully settled cash options	Options forfeited	Balance at 31 Dec 2019
To other senior executives	265.210	0	-450	-2,452	-3,907	-15,691	42,470	-40,276	0	244,904
Total	265.210	0	-450	-2,452	-3,907	-15,691	42,470	-40,276	0	244,904

Co-Performance Investment Plan (CPIP) and Performance Share Plan (PSP)

Performance Share Plan (PSP)

The PSP was launched in financial year 2016 for members of the Executive Board of Deutsche Börse AG as well as selected senior executives and employees of Deutsche Börse AG and of participating subsidiaries. The number of phantom PSP shares to be allocated is calculated based on the number of shares granted and the increase of net profit for the period attributable to Deutsche Börse AG shareholders, as well as on the relative performance of the total shareholder return (TSR) on Deutsche Börse AG's shares compared with the total shareholder return of the STOXX Europe 600 Financials Index constituents. The shares are subject to a performance period of five years. The subsequent payment of the stock bonus will be settled in cash. For further details on this plan, please see the [“Principles governing the PSP and assessing target achievement for performance shares”](#) section in the remuneration report.

The 100 per cent stock bonus target was calculated in euros for each Executive Board member. The 100 per cent stock bonus target for selected executives and employees of Deutsche Börse AG and participating subsidiaries is defined by the responsible decision-making bodies. Based on the PSP 100 per cent stock bonus target, the corresponding number of phantom shares for each beneficiary was calculated by dividing the stock bonus target by the average share price (Xetra closing price) of Deutsche Börse AG's shares in the last calendar month preceding the performance period. Any right to payment of a PSP stock bonus vested only at the end of a five-year performance period.

The final number of Performance Shares was calculated by multiplying the original number of Performance Shares with the level of overall target achievement. The PSP level of overall target achievement was based on two performance factors during the performance period: firstly, on the relative performance of the total shareholder return (TSR) on Deutsche Börse AG's shares compared with the total shareholder return of the STOXX Europe 600 Financials Index as the peer group; and secondly, on the increase of Deutsche Börse AG's net profit for the period attributable to shareholders of the parent company. The two performance factors contribute 50 per cent each to calculate overall target achievement.

The payout amount is calculated by multiplying the final number of performance shares with the average share price (Xetra closing price) of Deutsche Börse AG's shares in the last calendar month preceding the performance period, plus the total of dividend payments made during the performance period based on the final number of performance shares. The plans are settled in cash.

Co-Performance Investment Plan (CPIP)

In financial year 2015, a new remuneration programme (Co-Performance Investment Plan, CPIP) was introduced, and the former CEO of Deutsche Börse AG, Carsten Kengeter, was offered a one-time participation. The appropriate number of phantom shares was calculated based on the number of shares granted and the increase of Deutsche Börse AG's net profit for the period attributable to shareholders of Deutsche Börse AG, as well as on the relative performance of the total shareholder return (TSR) on Deutsche Börse AG's shares compared with the total shareholder return of the STOXX Europe 600 Financials Index entities. The performance period for the measurement of the performance criteria commenced on 1 January 2015 and ends on 31 December 2019. The shares are subject to a performance period of five years and a waiting period until 31 December 2019. The subsequent payment of the stock bonus will be settled in cash, by 31 March 2021.

Evaluation of the CPIP and the PSP

The company uses an adjusted Black-Scholes model (Merton model) to calculate the fair value of the CPIP and PSP stock options.

Valuation parameters for CPIP and PSP shares

		Tranche 2019	Tranche 2018	Tranche 2017	Tranche 2016	Tranche 2015
Term to		31 Dec 2023	31 Dec 2022	31 Dec 2021	31 Dec 2020	31 Dec 2019
Risk-free interest rate	%	-0.64	-0.66	-0.66	-0.64	-0.66
Volatility of Deutsche Börse AG shares	%	19.80	18.43	18.92	18.10	18.20
Dividend yield	%	0	0	0	0	0
Excerciseprice	€	0	0	0	0	0
Relative otal shareholder return	%	140.00	250.00	250.00	250.00	250.00
Net profit for the period attributable to Deutsche Börse AG shareholders	%	133.00	157.00	152.00; 163.00	0	172.00

The valuation model does not take into account exercise hurdles. The volatilities applied correspond to the market volatilities of comparable options with comparable maturities.

Valuation of CPIP and PSP shares

Tranche	Balance as at 31 Dec 2019 Number	Deutsche Börse AG share price as at 31 Dec 2019 €	Intrinsic value/option as at 31 Dec 2019 €	Fair value/option as at 31 Dec 2019 €	Settlement obligation €m	Current provision as at 31 Dec 2019 €m	Non-current provision as at 31 Dec 2019 €m
2015	87,574	140.15	140.15	150.33	11.0	0	11.0
2016	140,031	140.15	140.15	51.88 -150.12	19.4	0	19.4
2017	139,681	140.15	140.15	88.71-147.85	16.9	0	16.9
2018	142,431	140.15	140.15	11.66-145.45	13.2	0	13.2
2019	79,761	140.15	140.15	28.59-142.93	3.4	0	3.4
Total	589,478				63.9	0	63.9

Provisions for the CPIP and the PSP amounting to €64.0 million were recognised at the reporting date of 31 December 2019 (31 December 2018: €40.1 million). Of the provisions, €11.2 million were attributable to members of the Executive Board (2018: €15.9 million). The total expense for CPIP and PSP stock options in the reporting period was €23.9 million (2018: €23.3 million). Of that amount, an expense of €6.7 million was attributable to members of the Executive Board (2018: €13.1 million).

Change in number of CPIP and PSP shares allocated

	Balance at 31 Dec 2018	Additions Tranche 2015	Additions Tranche 2016	Additions/ (disposals) Tranche 2017	Additions Tranche 2018	Additions Tranche 2019	Fully settled cash options	Options forfeited	Balance at 31 Dec 2019
To the Executive Board ¹⁾	430,397	0	6,361	2,524	19,659	47,215	0	- 45,308	460,848
To other senior executives	106,664	0	2,385	- 909	450	20,040	0	0	128,630
Total	537,061	0	8,746	1,615	20,109	67,255	0	- 45,308	589,478

1) Active and former members of the Executive Board

For further information on the number of stock options granted to Executive Board members, and on the remuneration system for Executive Board members, please refer to the [remuneration report](#).

Group Share Plan (GSP)

Employees of Deutsche Börse Group who are not members of the Executive Board or senior executives have the opportunity to acquire shares of Deutsche Börse AG at a discount under the Group Share Plan (GSP). Under the GSP tranche for the year 2019, the participating employees could subscribe for up to 50 shares of the Company at a discount of 40 per cent and another 50 shares at a discount of 10 per cent. The acquired shares are subject to a lock-up period of two years.

The expense of this discount is recognised in the income statement at the grant date. In the reporting period, an expense totalling €4.1 million (2018: €4.0 million) was recognised in staff expense for the GSP.

Management Incentive Programme (MIP)

Das MIP was set up for the senior management of the Qontigo Group. It grants a non-current remuneration component in the form of virtual shares of the Qontigo Group. The remuneration is paid in cash. These are generally accounted for as sharebased payments. The amounts payable to the beneficiaries are intended to reflect the economic development of the Qontigo Group. The MIP contains a time-based and a performance-based component. The vesting period is four years and starts one year after closing.

Valuation

The value of the virtual shares is determined using a Monte Carlo simulation on the respective balance sheet date, which appropriately reflects the contract-specific conditions. The underlying simulations depend on the underlying from which the payment is linked to the beneficiaries of the MIP. The enterprise value of the Qontigo Group serves as the underlying. On the basis of the simulations carried out, a discounted average payment of the contractually agreed payment flows to the respective participants as calculated. The main valuation parameters include the enterprise value and the expected volatility of the Qontigo Group as well as the expected term and the contract-specific payment profile.

26. Executive bodies

The members of the company's executive bodies are listed in the [“The Executive Board”](#) and [“The Supervisory Board”](#) chapters of this annual report.

27. Corporate governance

On 10 December 2019, the Executive and Supervisory Boards issued the latest version of the declaration of conformity in accordance with section 161 of the Aktiengesetz (AktG, the German Stock Corporation Act) and made it permanently available to shareholders on the company's website (see also the [combined corporate governance declaration statement and corporate governance report](#)).

28. Related party disclosures

Related parties as defined by IAS 24 are members of the executive bodies of Deutsche Börse AG as well as the companies classified as associates of Deutsche Börse AG, investors and investees, and companies that are controlled or significantly influenced by members of the executive bodies.

The remuneration of the individual members of the Executive and Supervisory Boards is presented in the [remuneration report](#).

Executive Board

In 2019, the fixed and variable remuneration of the members of the Executive Board, including non-cash benefits granted in the financial year, amounted to €19.5 million (2018: €21.0 million). During the year under review, expenses of €6.9 million (2018: €11.8 million) were recognised in connection with share-based payments to Executive Board members.

The actuarial present value of the pension obligations to Executive Board members was €15.6 million as at 31 December 2019 (2018: €28.8 million). Expenses of €2.2 million (2018: €3.2 million) were recognised as additions to pension provisions.

Former members of the Executive Board or their surviving dependants

The remuneration paid to former members of the Executive Board or their surviving dependants amounted to €9.7 million in 2019 (2018: €4.4 million). The actuarial present value of the pension obligations was €84.8 million as at 31 December 2019 (2018: €67.5 million).

Termination benefits

Expenses of €2.3 million were recognised in connection with the termination of Executive Board appointments. €2.0 million thereof are attributable to share-based payments to former Executive Board members.

Supervisory Board

The aggregate remuneration paid to members of the Supervisory Board in the reporting year was €2.4 million (2018: €2.2 million).

In financial year 2019, the employee representatives on Deutsche Börse AG's Supervisory Board received remuneration (excluding Supervisory Board remuneration) amounting to €1.1 million (2018: €0.7 million). The total consists of the fixed and variable salary components for those employee representatives.

Business relationships with related parties and key management personnel

The following table shows transactions entered into within the scope of business relationships with non-consolidated companies of Deutsche Börse AG during the 2019 financial year. All transactions were concluded at prevailing market terms.

Transactions with related parties

	Amount of the transactions: revenues		Amount of the transactions: expenses		Outstanding balances: receivables		Outstanding balances: liabilities	
	2019 €m	2018 €m	2019 €m	2018 €m	31 Dec 2019 €m	31 Dec 2018 €m	31 Dec 2019 €m	31 Dec 2018 €m
Associates	14.3	11.2	-20.7	-19.1	2.3	1.2	-2.2	-1.0
Total	14.3	11.2	-20.7	-19.1	2.3	1.2	-2.2	-1.0

Business relationships with key management personnel

Key management personnel are persons who directly or indirectly have authority and responsibility for planning, directing and controlling the activities of Deutsche Börse Group. The Group defines the members of the Executive Board and the Supervisory Board as key management personnel for the purposes of IAS 24.

European Commodity Clearing Luxembourg S. à r.l., Luxembourg, Luxembourg (ECC Luxembourg) – a subsidiary of European Commodity Clearing AG and therefore a member of the EEX group – entered into a managing director agreement with IDS Lux S. à r.l., Luxembourg. The subject of the agreement is to provide a natural person for the function of managing director in the management of ECC Luxembourg. In addition to this position as managing director of ECC Luxembourg, this person is also a member of the key management personnel at IDS Lux S.à r.l. In the financial year 2019, ECC Luxembourg made payments in the amount of approximately €14 thousand for these management services.

On the board of directors of Powernext SAS, Paris, France – one of the subsidiaries of European Energy Exchange AG, Leipzig, Germany – there are representatives of GRTgaz, Bois-Colombes, France, the parent company of 3GRT, Tarascon, France, and EDEV S.A., Courbevoie, France. During the 2019 financial year, Powernext SAS rendered development and maintenance services for customised software solutions in the area of market coupling and balancing, as well as in connection with an electronic trading platform for 3GRT. In this context, the Group generated revenue of €735.6 thousand in 2019. As at 31 December 2019, receivables amounted to €148.8 thousand.

The Board of Directors of LuxCSD S.A., Luxembourg, an associate from Deutsche Börse Group’s perspective, comprises two members of management of fully consolidated subsidiaries who are maintaining a key position within these subsidiaries of Deutsche Börse Group. There are business relationships with Clearstream Banking S.A., Luxembourg, Clearstream Services S.A., Luxembourg, Clearstream International S.A., Luxembourg, Clearstream Banking AG, Frankfurt/Main, Germany, and Deutsche Börse AG, Frankfurt/Main, Germany, to LuxCSD S.A. Overall, revenue of €2,264.9 thousand as well as expenses of €1,130.5 thousand were recognised for such contracts during the reporting year.

Furthermore, an Executive Board member of Clearstream Banking AG concurrently holds an executive position within Deutsche Börse Commodities GmbH, Frankfurt/Main, Germany, an associate of Deutsche Börse Group. During the 2019 financial year, Deutsche Börse Group realised revenue of €5,415.2 thousand and incurred expenses of €17,430.9 thousand based on the business relationship with Deutsche Börse Commodities GmbH.

One Executive Board member of Deutsche Börse AG as well as one Supervisory Board member of a fully-consolidated company of Deutsche Börse Group are members of the Supervisory Board of China Europe International AG (CEINEX), Frankfurt/Main, Germany. This stock corporation was established as a joint venture between Shanghai Stock Exchange Ltd., Shanghai, China; China Financial Futures Exchange, Shanghai, China; and Deutsche Börse AG. During the 2019 financial year, Deutsche Börse Group realised revenue of €160.2 thousand and incurred expenses of €40.3 thousand based on the business relationship with CEINEX.

A member of the management of Axioma Inc., New York, USA, as well as one related party to this company which exercises control over the company Cloud9 Smart, New York, USA, maintain business relationships with each other. In the context of the services provided by Cloud9 Smart and Axioma Inc., expenses of €26.1 thousand were incurred in 2019. As at 31 December 2019, liabilities amounted to €9.8 thousand.

Selected executives of Deutsche Börse Group companies also hold a key management position within the Clearstream Pension Fund, an “association d’épargne pension” (ASSEP) under Luxembourg law. By means of cash contributions to this ASSEP, Clearstream International S.A., Clearstream Banking S.A., as well as Clearstream Services S.A., fund the defined benefit plan established in favour of their Luxembourg employees.

29. Employees

Employees	2019	2018
Average number of employees during the year	6,289	5,800
Employed at the reporting date	6,775	5,964
Employees (average annual FTEs)	5,841	5,397

Of the average number of employees during the year, 26 (2018: 30) were classified as Managing Directors (excluding Executive Board members), 318 (2018: 333) as senior executives and 5,945 (2018: 5,437) as employees.

There was an average of 5,841 full-time equivalent (FTE) employees during the year (2018: 5,397). Please also refer to the [“Employees” section in the combined management report](#).

30. Events after the end of the reporting period

On 21 January 2020, Deutsche Börse Group's post-trade services provider Clearstream and UBS agreed on a partnership in the investment fund services business segment. For this purpose, the companies entered into an agreement by which Clearstream acquires 51 per cent of Zurich-based fund distribution platform Fondcenter AG from UBS for CHF 389 million. UBS will retain a minority of 49 per cent. The transaction is expected to be closed in the second half of 2020. Fondcenter will be consolidated following the closing of the transaction.

31. Date of approval for publication

Deutsche Börse AG's Executive Board approved the consolidated financial statements for submission to the Supervisory Board on 02 March 2020. The Supervisory Board is responsible for examining the consolidated financial statements and stating whether it endorses them.

32. Disclosures on material non-controlling interests

Material non-controlling interests

	European Energy Exchange AG, Leipzig		Qontigo GmbH, Frankfurt am Main	
	31 Dec 2019 €m	31 Dec 2018 €m	31 Dec 2019 €m	31 Dec 2018 €m
Attributable to non-controlling interests:				
Capital (%)	75.1	75.1	78.3	-
Voting rights (%)	62.8	62.8	78.3	-
Net profit for the period (in €m)	53.9	43.8	32.8	-
Equity (in €m)	472.8	434.2	783.4	-
Dividend payments (in €m)	16.2	16.2	0	-
Assets (in €m)	527.0	502.1	1,018.5	-
Liabilities (in €m)	54.2	67.9	235.1	-
Profit/loss (in €m)	53.9	43.8	32.8	-
Other comprehensive income (in €m)	0.9	1.9	-10.2	-
Comprehensive income (in €m)	54.8	45.7	22.6	-
Cashflows (in €m)	-7.5	49.2	139.1	-

33. Disclosures on associates

Deutsche Börse Group does not have any material associates. The following table shows summarised financial information for the individual associates that are immaterial when considered separately.

Non-material associates

	31 Dec 2019 €m	31 Dec 2018 €m
Book value of non-material associates	44.5	42.5
Profit after tax	0.9 ¹⁾	1.7
Other comprehensive income	0	0
Comprehensive income	0.9	1.7

1) Disclosures are based on preliminary and unaudited figures which may be adjusted subsequently.

34. List of shareholdings

Deutsche Börse AG's equity interests in subsidiaries, associates and joint ventures as at 31 December 2019 included in the consolidated financial statements are presented in the following tables.

Consolidated subsidiaries (part 1)

Company	Domicile	Equity interest as at 31 Dec 2019 direct/(indirect) %
Assam SellerCo, Inc. in Liquidation	New York, USA	100.00
Assam SellerCo Service, Inc. in Liquidation	New York, USA	(100.00)
Need to Know News, LLC in Liquidation	Chicago, USA	(100.00)
Börse Frankfurt Zertifikate AG	Frankfurt/Main, Germany	100.00
Clearstream Holding AG	Frankfurt/Main, Germany	100.00
Clearstream Banking AG	Frankfurt/Main, Germany	(100.00)
Clearstream Banking S.A.	Luxembourg, Luxembourg	(100.00)
Ausmaq Ltd.	Sydney, Australia	(100.00)
Clearstream Banking Japan, Ltd.	Tokyo, Japan	(100.00)
REGIS-TR S.A.	Luxembourg, Luxembourg	(50.00)
Clearstream Global Securities Services Limited	Cork, Ireland	(100.00)
Clearstream International S.A.	Luxembourg, Luxembourg	(100.00)
Clearstream Operations Prague s.r.o.	Prague, Czech Republic	(100.00)
Clearstream Services S.A.	Luxembourg, Luxembourg	(100.00)
REGIS-TR UK Ltd. (dormant)	London, United Kingdom	(50.00)
DB1 Ventures GmbH	Frankfurt/Main, Germany	100.00
Deutsche Boerse Market Data + Services Singapore Pte. Ltd.	Singapore, Singapore	100.00
Deutsche Boerse Systems Inc.	Chicago, USA	100.00
Deutsche Börse Photography Foundation gGmbH	Frankfurt/Main, Germany	100.00
Deutsche Börse Services s.r.o.	Prague, Czech Republic	100.00
Deutsche Börse Shareholdings GmbH (dormant)	Frankfurt/Main, Germany	100.00
Eurex Frankfurt AG	Frankfurt/Main, Germany	100.00
Eurex Clearing AG	Frankfurt/Main, Germany	(100.00)
Eurex Clearing Security Trustee GmbH	Frankfurt/Main, Germany	(100.00)
Eurex Repo GmbH	Frankfurt/Main, Germany	(100.00)
Eurex Securities Transactions Services GmbH	Frankfurt/Main, Germany	(100.00)
Eurex Global Derivatives AG	Zug, Switzerland	100.00
Eurex Services GmbH	Frankfurt/Main, Germany	100.00

Consolidated subsidiaries (part 2)

Company	Domicile	Equity interest as at 31 Dec 2019 direct/(indirect) %
European Energy Exchange AG	Leipzig, Germany	75.05
EEX Asia Pte. Limited	Singapore, Singapore	(75.05)
EEX Link GmbH	Leipzig, Germany	(75.05)
European Commodity Clearing AG	Leipzig, Germany	(75.05)
European Commodity Clearing Luxembourg S.à r.l.	Luxembourg, Luxembourg	(75.05)
Grexel Systems Oy	Helsinki, Finland	(75.05)
Nodal Exchange Holdings, LLC	Tysons Corner, USA	(75.05)
Nodal Exchange, LLC	Tysons Corner, USA	(75.05)
Nodal Clear, LLC	Tysons Corner, USA	(75.05)
Powernext SAS	Paris, France	(75.05)
Gaspoint Nordic A/S	Brøndby, Denmark	(75.05)
PEGAS CEGH Gas Exchange Services GmbH	Vienna, Austria	(38.27)
EPEX SPOT SE	Paris, France	(38.27)
EPEX Netherlands B.V.	Amsterdam, Netherlands	(38.27)
EPEX SPOT Schweiz AG	Bern, Switzerland	(38.27)
Power Exchange Central Europe a.s.	Prague, Czech Republic	(50.03)
Qontigo GmbH	Frankfurt/Main, Germany	78.32
Axioma Inc.	New York, USA	(78.32)
Axioma (CH) GmbH	Geneva, Switzerland	(78.32)
Axioma (HK) Ltd.	Hong Kong, Hong Kong	(78.32)
Axioma (UK) Ltd.	London, United Kingdom	(78.32)
Axioma Argentina S.A.U.	Buenos Aires, Argentina	(78.32)
Axioma Asia Pte Ltd.	Singapore, Singapore	(78.32)
Axioma Germany GmbH	Frankfurt/Main, Germany	(78.32)
Axioma Japan G.K.	Tokyo, Japan	(78.32)
Axioma Ltd.	Sydney, Australia	(78.32)
Axioma S.A.S.U.	Paris, France	(78.32)
Qontigo Index GmbH	Frankfurt/Main, Germany	(78.32)
Stoxx Ltd.	Zug, Switzerland	(78.32)
INDEX PROXXY Ltd.	London, United Kingdom	(78.32)
STOXX Australia Pty Limited (in liquidation)	Sydney, Australia	(78.32)
Regulatory Services GmbH	Frankfurt/Main, Germany	100.00
Tradegate Exchange GmbH	Berlin, Germany	63.92
Börse Berlin AG	Berlin, Germany	(63.97) ¹⁾
360 Treasury Systems AG	Frankfurt/Main, Germany	100.00
360 Trading Networks Inc.	New York, USA	(100.00)
360 Trading Networks Limited	Dubai, United Arab Emirates (UAE)	(100.00)
360 Trading Networks Sdn Bhd	Kuala Lumpur, Malaysia	(100.00)
360T Asia Pacific Pte. Ltd.	Singapore, Singapore	(100.00)
360TGTX Inc.	New York, USA	(100.00)
Finbird GmbH	Frankfurt/Main, Germany	(100.00)
Finbird Limited (in liquidation)	Jerusalem, Israel	(100.00)
ThreeSixty Trading Networks (India) Pte. Ltd.	Mumbai, India	(100.00)

1) Thereof 59,98 per cent direct and 3,99 per cent indirect

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Associates

Company	Domicile	Equity interest as at 31 Dec 2019 direct/(indirect) %
BrainTrade Gesellschaft für Börsensysteme mbH	Frankfurt/Main, Germany	(37.72)
China Europe International Exchange AG	Frankfurt/Main, Germany	40.00
Deutsche Börse Commodities GmbH	Frankfurt/Main, Germany	16.20
enermarket GmbH	Frankfurt/Main, Germany	(30.02)
HQLAx S.à r.l.	Luxembourg, Luxembourg	35.13
LuxCSD S.A.	Luxembourg, Luxembourg	(50.00)
R5FX Ltd	London, United Kingdom	15.65
SEEPEX a.d.	Belgrade, Serbia	(9.57)
SPARK Commodities Ltd.	Singapore, Singapore	(18.76)
Tradegate AG Wertpapierhandelsbank	Berlin, Germany	19.99
ZDB Cloud Exchange GmbH in Liquidation	Eschborn, Germany	49.90
Zimory GmbH in Liquidation	Berlin, Germany	30.03

Responsibility statement by the Executive Board


To the best of our knowledge, and in accordance with the applicable reporting principles, the consolidated financial statements give a true and fair view of the assets, liabilities, financial position and profit or loss of the Group, and the combined management report includes a fair review of the development and performance of the business and the position of the Group, together with a description of the principal opportunities and risks associated with the expected development of the Group.

Frankfurt/Main, 6 March 2020

Deutsche Börse AG


Theodor Weimer


Christoph Böhm


Thomas Book


Stephan Leithner


Gregor Pottmeyer


Hauke Stars

Independent Auditors' Report

To Deutsche Börse Aktiengesellschaft, Frankfurt am Main

Report on the Audit of the Consolidated Financial Statements and Combined Management Report

Opinions

We have audited the consolidated financial statements of Deutsche Börse Aktiengesellschaft, Frankfurt am Main, and its subsidiaries (the Group), which comprise the consolidated balance sheet as of 31 December 2019, the consolidated income statement, the consolidated statement of comprehensive income, the consolidated cash flow statement and the consolidated statement of changes in equity for the financial year from 1 January to 31 December 2019, and notes to the consolidated financial statements, including a summary of significant accounting policies. In addition, we have audited the combined management report of Deutsche Börse Aktiengesellschaft, Frankfurt am Main, for the financial year from 1 January to 31 December 2019, including the combined non-financial statement in line with Sections 289b(1), 289c, 315b and 315c HGB [Handelsgesetzbuch: German Commercial Code]. In accordance with the legal requirements applicable in Germany, we did not audit the components of the combined management report which we have identified in the „Other information“ section of our audit opinion.

The combined management report comprises links to the Group's website which are not required by law. In accordance with the legal requirements applicable in Germany, we did not audit these links, nor the information referred to in the links.

In our opinion, on the basis of the knowledge obtained in the audit,

- the accompanying consolidated financial statements comply in all material respects with the IFRSs as adopted by the EU and the additional requirements of German commercial law pursuant to Section 315e(1) HGB [Handelsgesetzbuch: German Commercial Code] and, in compliance with these requirements, give a true and fair view of the assets, liabilities, and financial position of the Group as of 31 December 2019 and of its financial performance for the financial year from 1 January to 31 December 2019, and the accompanying combined management report as a whole provides an appropriate view of the Group's position
- In all material respects, the combined management report is consistent with the consolidated financial statements, complies with German legal requirements and appropriately presents the opportunities and risks of future development. Our opinion on the combined management report does not cover the content of the components of the combined management report which we have identified in the „Other information“ section of our audit opinion. The combined management report comprises links to the Group's website which are not required by law. Our opinion does not cover the links, nor the information referred to in the links.

Pursuant to Section 322(3) sentence 1 HGB, we declare that our audit has not led to any reservations relating to the legal compliance of the consolidated financial statements and of the combined management report.

Basis for the Opinions

We conducted our audit of the consolidated financial statements and combined management report in accordance with Section 317 HGB and the EU Audit Regulation No 537/2014 (referred to subsequently as 'EU Audit Regulation') and in compliance with German Generally Accepted Standards for Financial Statement Audits promulgated by the Institut der Wirtschaftsprüfer [Institute of Public Auditors in Germany] (IDW). Our responsibilities under those requirements and principles are further described in the 'Auditor's Responsibilities for the Audit of the Consolidated Financial Statements and Combined Management Report' section of our auditor's report. We are independent of the group entities in accordance with the requirements of European law and German commercial and professional law, and we have fulfilled our other German professional responsibilities in accordance with these requirements. In addition, in accordance with Article 10(2) point (f) of the EU Audit Regulation, we declare that we have not provided non-audit services prohibited under Article 5(1) of the EU Audit Regulation. We believe that the evidence we have obtained is sufficient and appropriate to provide a basis for our opinions on the consolidated financial statements and on the combined management report.

Key Audit Matters in the Audit of the Consolidated Financial Statements

Key audit matters are those matters that, in our professional judgement, were of most significance in our audit of the consolidated financial statements for the financial year from 1 January to 31 December 2019. These matters were addressed in the context of our audit of the consolidated financial statements as a whole, and in forming our opinion thereon; we do not provide a separate opinion on these matters.

Impairment of the goodwill

For the accounting policies applied as well as the assumptions used, please refer to note 2 (Consolidation principles) and note 11 (Intangible assets) in the notes to the consolidated financial statements.

THE FINANCIAL STATEMENT RISK

At 31 December 2019, goodwill amounted to EUR 3,470.5 million (previous year: EUR 2,865.6 million). The goodwill thus represents 2.5 per cent of the assets of the Group at 31 December 2019.

Goodwill is subjected to an impairment test by the company at least once a year and also on an ad hoc basis, if appropriate. For this purpose, the carrying amount is compared with the recoverable amount of the cash-generating unit (CGU). Deutsche Börse AG determines the recoverable amounts of the cash-generating units either on the basis of the value in use or on the basis of the fair value less costs of disposal. If the carrying amount is higher than the recoverable amount, there is a need for impairment.

The result of these valuations is highly dependent upon assumptions concerning future cash inflows, based on the corporate planning, as well as the defined parameters. As a result, the valuations are subject to discretion. Any need for impairment that may arise as a result can have a material impact on the statement of the assets, liabilities and financial performance of the Group. Therefore, the correct determination of any need for impairment is of particular significance for the financial statements.

OUR AUDIT APPROACH

With the support of our valuation experts, we have assessed the valuation models used by the company as well as the appropriateness of the significant assumptions relating to valuation parameters. We assessed the appropriateness of the assumptions used in the determination of the discount rates by comparing them with market- and industry-specific reference values; we additionally verified the calculation method used to determine the discount rates. We compared the expected cash inflows and outflows used for the calculations with the current budget plan approved by management. In order to assess the appropriateness of the assumptions used when the budget plan was drawn up, we first discussed these in meetings with management. Then we compared the assumptions used with relevant peer group companies, and evaluated analyst reports on the market segments. We furthermore appraised the reliability of the forecasts in previous years based on whether they occurred or not. Within the scope of our own sensitivity analyses, we determined whether there would be a need for impairment in the event of possible changes in the assumptions in realistic ranges.

OUR OBSERVATIONS

The calculation method used by the company is appropriate and consistent with the relevant valuation principles. The underlying assumptions about the valuation-relevant parameters have been calculated in a balanced way and are within acceptable ranges.

Impairment of the other intangible assets

For the accounting policies applied as well as the assumptions used, please refer to note 2 (Consolidation principles) and note 11 (Intangible assets) in the notes to the consolidated financial statements.

THE FINANCIAL STATEMENT RISK

At 31 December 2019, other intangible assets amounted to EUR 1,040.9 million (previous year: EUR 952.7 million). Other intangible assets thus represents 0.8 per cent of the Group's assets as at 31 December 2019.

The other intangible assets with indefinite useful lives are subject to an impairment test by the company at least once a year, and also on an ad hoc basis, if appropriate. For this purpose, Deutsche Börse AG determines the recoverable amounts of the intangible asset or cash-generating units, in case no independent cash flows can be allocated to that specific intangible asset, either on the basis of the value in use or on the basis of the fair value less costs of disposal. The result of these valuations is highly dependent upon assumptions concerning future cash inflows, based on the corporate planning, as well as the defined parameters. As a result, the valuations are subject to discretion. Any need for impairment that may arise as a result can have a material impact on the statement of the assets, liabilities and financial performance of the Group. Therefore, the correct determination of any need for impairment is of particular significance for the financial statements.

OUR AUDIT APPROACH

With the support of our valuation experts, we have assessed the valuation models used by the company as well as the appropriateness of the significant assumptions relating to valuation parameters. We assessed the appropriateness of the assumptions used in the determination of the discount rates by comparing them with market- and industry-specific reference values; we additionally verified the calculation method used to determine the discount rates. We compared the expected cash inflows and outflows used for the calculations with the current budget plan approved by management. In order to assess the appropriateness of the assumptions used when the budget plan was drawn up, we first discussed these in meetings with management. Then we compared the assumptions used with relevant peer group companies, and evaluated analyst reports on the market segments. We furthermore appraised the reliability of the forecasts in previous years based on whether they occurred or not. Within the scope of our own sensitivity analyses, we determined whether there would be a need for impairment in the event of possible changes in the assumptions in realistic ranges.

OUR OBSERVATIONS

The calculation method used by the company is appropriate and consistent with the relevant valuation principles. The underlying assumptions about the valuation-relevant parameters have been calculated in a balanced way and are within acceptable ranges.

The valuation of provisions for tax risks

For the accounting policies applied as well as the assumptions used, please refer to note 10 (Income tax expense) in the notes to the consolidated financial statements. Information on the tax provisions and risks can be found in note 24 (Financial liabilities and other risks).

THE FINANCIAL STATEMENT RISK

The Group operates in a variety of jurisdictions with different legal systems. The provisions for tax risks amounted to €265.9 million at 31 December 2019.

The application of the local and international tax regulations and of tax relief is complex and associated with risks. The calculation of tax provisions requires the company to exercise judgement in the assessment of tax issues and to make estimates concerning tax risks. The result of these assessments is dependent to a large extent on assumptions concerning the future interpretation of tax situations in the course of tax audits, and also on decisions of the tax authorities and courts on similar tax situations, and is therefore subject to discretion. Any additional tax expenses can have a material impact on the statement of assets, liabilities and financial performance of the Group. Therefore, the identification and correct allocation of provisions for tax risks is of particular significance for the consolidated financial statements.

Deutsche Börse AG occasionally commissions external experts to assess tax matters.

OUR AUDIT APPROACH

With the support of our employees specialising in local and international tax law, we appraised the tax calculation, including the risk assessment, of Deutsche Börse AG. Where available, we have also acknowledged the assessment of external experts engaged by the company. We held meetings with

the management as well as staff from the tax department in order to gain an understanding of the existing tax risks. We have assessed the competence and the objectivity of external experts and evaluated the documents they have produced.

Furthermore, we evaluated the correspondence with the competent tax authorities and assessed the assumptions used to determine the tax provisions on the basis of our knowledge and experience of the current application of the relevant legal regulations by the authorities and the courts.

OUR OBSERVATIONS

The assumptions for determining the tax provisions are appropriate.

Other Information

The company's management, or the Supervisory Board, is responsible for the other information. The other information comprises:

the combined corporate governance statement, which is disclosed in the section "Combined corporate governance statement and corporate governance report". Other information also comprises the other parts of the annual report.

However, other information does not comprise the consolidated financial statements, the audited disclosures of the combined management report as well as our corresponding auditor's report.

Our opinions on the consolidated financial statements and on the combined management report do not cover the other information, and consequently we do not express an opinion or any other form of assurance conclusion thereon.

In connection with our audit, our responsibility is to read the other information and, in so doing, to consider whether the other information is

- materially inconsistent with the consolidated financial statements, with the audited disclosures in the combined management report or our knowledge obtained in the audit, or
- otherwise appears to be materially misstated.

Responsibilities of Management and the Supervisory Board for the Consolidated Financial Statements and Combined Management Report

Management is responsible for the preparation of the consolidated financial statements that comply, in all material respects, with IFRSs as adopted by the EU, and the additional requirements of German commercial law pursuant to Section 315e(1) HGB, and that the consolidated financial statements, in compliance with these requirements, give a true and fair view of the assets, liabilities, financial position and financial performance of the Group. In addition, management is responsible for such internal control as they have determined 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, management is responsible for assessing the Group's ability to continue as a going concern. Moreover, the company's management has the responsibility to disclose any matters that are relevant for the going concern assumption. In addition, they are responsible for financial reporting based on the going concern basis of accounting unless there is an intention to liquidate the Group or to cease operations, or there is no realistic alternative but to do so.

Furthermore, management is responsible for the preparation of the combined management report that, as a whole, provides an appropriate view of the Group's position and is, in all material respects, consistent with the consolidated financial statements, complies with German legal requirements and appropriately presents the opportunities and risks of future development. In addition, management is responsible for such arrangements and measures (systems) as they have considered necessary to enable the preparation of the combined management report that is in accordance with the applicable German legal requirements and to be able to provide sufficient appropriate evidence for the assertions in the combined management report.

The supervisory board is responsible for overseeing the Group's financial reporting process for the preparation of the consolidated financial statements and of the combined management report.

Auditor's Responsibilities for the Audit of the Consolidated Financial Statements and the Combined Management Report

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 whether the combined management report as a whole provides an appropriate view of the Group's position and, in all material respects, is consistent with the consolidated financial statements and the knowledge obtained in the audit, complies with the German legal requirements, and appropriately presents the opportunities and risks of future development, as well as to issue an auditor's report that includes our opinions on the consolidated financial statements and on the combined management report.

Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Section 317 HGB and the EU Audit Regulation and in compliance with German Generally Accepted Standards for Financial Statement Audits promulgated by the Institut der Wirtschaftsprüfer (IDW) will always detect a material misstatement. 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 and this combined management report.

We exercise professional judgement and maintain professional scepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the consolidated financial statements and the combined management report, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinions. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of the internal control system relevant to the audit of the consolidated financial statements, and of arrangements and measures (systems) relevant to the audit of the combined management report, in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of these systems.

- Evaluate the appropriateness of accounting policies used by management and the reasonableness of estimates made by management and related disclosures.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Group's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in the auditor's report to the related disclosures in the consolidated financial statements and in the combined management report or, if such disclosures are inadequate, to modify our respective opinions. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the Group to cease to be able to continue as a going concern.
- Evaluate the overall presentation, structure and content of the consolidated financial statements, including the disclosures, and whether the consolidated financial statements present the underlying transactions and events in a manner that the consolidated financial statements give a true and fair view of the assets, liabilities, financial position, and financial performance of the Group in compliance with IFRSs as adopted by the EU and the additional requirements of German commercial law pursuant to Section 315e(1) HGB.
- Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the Group to express opinions on the consolidated financial statements and on the combined management report. We are responsible for the direction, supervision and performance of the group audit. We remain solely responsible for our opinions.
- Evaluate the consistency of the combined management report with the consolidated financial statements, its conformity with German law, and the view of the Group's position it provides. Perform audit procedures on the prospective information presented by management in the combined management report. On the basis of sufficient appropriate audit evidence, we evaluate, in particular the significant assumptions used by management as a basis for the prospective information, and evaluate the proper derivation of the prospective information from these assumptions. We do not express a separate opinion on the prospective information and on the assumptions used as a basis. There is a substantial unavoidable risk that future events will differ materially from the prospective information.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

We also provide those charged with governance with a statement that we have complied with the relevant independence requirements, and communicate with them all relationships and other matters that may reasonably be thought to bear on our independence and, where applicable, the related safeguards.

From the matters communicated with those charged with governance, we determine those matters that were of most significance in the audit of the consolidated financial statements of the current period and are therefore the key audit matters. We describe these matters in our auditor's report unless law or regulation precludes public disclosure about the matter.

Other Legal and Regulatory Requirements

Further information pursuant to Article 10 of the EU Audit Regulation

We were elected as group auditors by the annual general meeting held on 8 May 2019. We were engaged by the chair of the audit committee of the Supervisory Board on 28 June 2019. In compliance with the transitional provisions of Article 41(2) of the EU Audit Regulations, we have been engaged as auditors of the consolidated financial statements of Deutsche Börse AG without interruption since the 2001 financial year.

We declare that the opinions expressed in this auditor's report are consistent with the additional report to the audit committee pursuant to Article 11 of the EU Audit Regulation (long form audit report).

In addition to the consolidated financial statements, we audited the annual financial statements of Deutsche Börse AG and carried out various annual audits of subsidiaries. The audits included reviews of interim financial statements. Other certification services relate to ISAE 3402 and ISAE 3000 reports, and statutory or contractual audits such as audits under the WpHG, KWG as well as other contractually agreed assurance services.

Tax services include assistance in the preparation of tax returns, tax appraisals and advice on individual matters, and tax advice related to the external audit.

As part of other services, we supported Deutsche Börse AG with quality assurance measures and forensic services.

German Public Auditor Responsible for the Engagement

The German Public Auditor responsible for the engagement is Klaus-Ulrich Pfeiffer.

Frankfurt am Main, 6 March 2020

KPMG AG

Wirtschaftsprüfungsgesellschaft

gez. Leitz
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