Deutsche Börse AG

Consolidated financial statements and notes

as at 31 December 2019

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 cenral counterparties		5,234.2	9,985.4	9,985.4
Other Financial liabilites 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 liabilites	–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 Leasing[1)]

	€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 Fankfurter 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 measurement[1]	**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
Expense from other financial assets FVPL	48.2	47.5
Interest expense on taxes	3.1	26.7
Interest expense from financial liabilities 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	31Dec 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 impairments 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 %	CAGR[1] 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

	Allocated Book Value €m	Risk-Free interest rate %	Market Risk Premium %	Discount Rate %	Perpetuity Growth Rate %	CAGR[1] Net Revenue %	CAGR[1] 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 buldings	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 Non-current €m	31 Dec 2019 Current €m	31 Dec 2019 Total €m	31 Dec 2018 Non-current €m	31 Dec 2018 Current €m	31 Dec 2018 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 pruchase 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 31 Dec 2018	thereof attributable to:		
		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 €	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 note2). 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 authorisation by the shareholders	Expiry date	Existing shareholders' pre-emptive rights may be disapplied for fractioning and/or may be disapplied 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	▪ 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 (acording 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, an 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 counter-cyclical 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 fullfilled 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	42.2[1]	23.8[1]
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 personnel 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 Dec2018 €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	8.7
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 revenes, 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 of financial instruments (part 1)

	Segment	Note	Carrying amounts – maximum risk exposure: Amount at 31 Dec 2019 €m	Carrying amounts – maximum risk exposure: Amount at 31 Dec 2018 €m	Collateral: Amount at 31 Dec 2019 €m	Collateral: Amount at 31 Dec 2018 €m
Collateralised cash investments						
Reverse repurchase agreements	Eurex (financial derivatives)[1]		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[1]		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 Amount at 31 Dec 2019 €m	Amount at 31 Dec 2018 €m	Collateral 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			**52,889.4**[9]	**47,969.5**[9]	**66,680.9**[10]	**61,752.1**[10]
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 traes at the reporting date as well as default fund requirements: this figure represents the riskoriented view of Eurex Clearing AG and European Commodity Clearing AG, while the carrying amount of the “financial instruments held by central counterparties” itemin the blance sheet shows the gross amount of the open trades acccording 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 secorities 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.

Ats 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 than360 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 than360 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 repective 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)

31.12. 2019	Contractual maturity: 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	Reconciliation to carrying amount €m	Carrying amount €m
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 liabilties (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 liabilites 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)

31.12. 2018	Contractual maturity						
	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	Reconcilia-tion to carrying amount €m	Carrying amount €m
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 liabilties 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 liabilties (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 liabilites 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

Tranch e	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
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 Dec2019
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 €15.6million 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

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

Frankfurt/Main, 2 March 2020
Deutsche Börse AG

Theodor Weimer   Christoph Böhm   Thomas Book

Stephan Leithner   Gregor Pottmeyer   Hauke Stars

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

Deutsche Börse AG

Combined management report

as at 31 December 2019

Combined management report

This combined management report covers both Deutsche Börse Group and Deutsche Börse AG and includes the combined non-financial statements according to the CSR Directive. It follows the requirements of the Handelsgesetzbuch (HGB, German Commercial Code) and the Deutscher Rechnungslegungs Standard Nr. 20 (DRS 20, German Accounting Standard No. 20).

Fundamental information about the Group

Overview of Deutsche Börse Group

Business operations and Group structure
Deutsche Börse AG, which is headquartered in Frankfurt/Main, Germany, is the parent company of Deutsche Börse Group. As at 31 December 2019, Deutsche Börse Group employed a total of 6,775 staff (31 December 2018: 5,640), having 105 nationalities at 41 locations in 27 countries around the globe. As one of the largest providers of market infrastructure worldwide, the Group offers a broad product and service range to its clients. These cover the entire financial market transaction process chain: from the provision of market information, indices and analytical solutions (pre-trading), the trading and clearing services on which these are based, and the settlement of transactions right through to the custody of securities and funds, as well as services for liquidity and collateral management (post-trading), related services for trading and clearing as well as settlement of orders right through to custody of securities and funds, as well as services for liquidity and collateral management (post-trading). The Group also develops and operates the IT systems that support all of these processes.

Deutsche Börse AG markets the price and reference data of the systems and platforms of Deutsche Börse Group as well as any other trading-relevant information. In addition, it develops and markets indices and analytics solutions via its subsidiary Qontigo GmbH. Furthermore, Deutsche Börse AG operates the Eurex Exchange futures and options market via Eurex Frankfurt AG. Commodities spot and derivatives markets are operated by the Group' s direct subsidiary European Energy Exchange AG (EEX). Via its subsidiary 360 Treasury Systems AG (360T), Deutsche Börse AG offers a platform for foreign exchange trading. The Group also operates the cash market at Frankfurter Wertpapierbörse (Frankfurt Stock Exchange – FWB®), with its fully electronic trading venue Xetra®, as well as offering trading in structured products (certificates and warrants) in Germany via the Börse Frankfurt Zertifikate AG exchange. The Group also offers clearing services for the cash and derivatives markets (Eurex Clearing AG). All post-trading services that Deutsche Börse Group provides for securities are handled by Clearstream Holding AG and its subsidiaries (Clearstream Holding group). These include transaction settlement, the administration and custody of securities, as well as services for investment funds and global securities financing. Deutsche Börse AG and Clearstream Services S.A. develop and operate Deutsche Börse Group's technological infrastructure.

Deutsche Börse Group's full group of consolidated entities is set out in note 34 to the consolidated financial statements.

Reporting segments

Deutsche Börse Group's business is divided into nine segments: Eurex (financial derivatives), EEX (commodities), 360T (foreign exchange), Xetra (securities trading), Clearstream (post-trading), IFS (investment fund services), GSF (collateral management), Qontigo (index and analytics business) and Data (data business).

This structure serves as a basis for the Group's internal management and financial reporting (see the following table entitled "Deutsche Börse Group's reporting segments" for details).

Deutsche Börse Group's reporting segments

Reporting segment	Business areas
Eurex (financial derivatives)	▪ Electronic trading of derivatives (Eurex Exchange) ▪ Eurex Repo® OTC trading platform ▪ C7® electronic clearing architecture ▪ Central counterparty for on- and off-exchange derivatives and repo transactions
EEX (commodities)	▪ Electronic trading of electricity and gas products as well as emission rights (EEX group) ▪ Central counterparty for traded cash market and derivative products
360T (foreign exchange)	▪ Electronic trading of foreign exchange (360T®) ▪ Central counterparty for OTC and exchange-traded derivatives
Xetra (securities trading)	▪ Cash market with the trading venues Xetra®, Börse Frankfurt and Tradegate ▪ Central counterparty for equities and bonds ▪ Listing
Clearstream (post-trading)	▪ Custody and settlement of securities
IFS (Investment Fund Services)	▪ Investment fund services (order routing, settlement and custody)
GSF (collateral management)	▪ Services for global securities finance and collateral management as well as collateralised money market transactions, repo and securities lending transactions
Qontigo (index and analytics business)	▪ Development and marketing of indices (STOXX® and DAX®) ▪ Innovative portfolio management and risk analysis software
Data (data business)	▪ Marketing of licences for trading and market signals ▪ Technology and reporting solutions for external clients ▪ Link-up of trading participants

Management
The governing bodies of Deutsche Börse AG, which is a German stock corporation, are the Annual General Meeting, the Supervisory Board and the Executive Board, each of which has its own areas of responsibility.

The Annual General Meeting rules on the appropriation of the unappropriated surplus, appoints the shareholder representatives on the Supervisory Board and approves the actions of the Executive Board and the Supervisory Board. In addition, it rules on corporate actions and other matters governed by the Aktiengesetz (AktG, German Stock Corporation Act).

The Supervisory Board appoints, supervises and advises the members of the Management Board, and is directly involved in decisions of fundamental importance to the Group. Additionally, it approves the consolidated financial statements prepared by the Executive Board. Members of the Supervisory Board are appointed for a period of three years, although the Annual General Meeting may determine a shorter term of office when electing members. As Deutsche Börse AG has more than 2,000 employees in Germany, members of the Supervisory Board must be appointed in accordance with the provisions of the Mitbestimmungsgesetz (German Co-Determination Act). Deutsche Börse's Supervisory Board comprises eight shareholder representatives and eight employee representatives in order to meet the growing demands placed upon Supervisory Board members in connection with the Company's growth and that of the Group as a whole, particularly with regard to the diversity and internationalisation of Supervisory Board work. Further details can be viewed in the "Combined declaration on corporate management and corporate governance report" section.

The Executive Board manages the company at its own responsibility; the Chief Executive Officer (CEO) coordinates the activities of the Executive Board members. In the 2019 financial year, the Executive Board of Deutsche Börse AG comprised six members. The remuneration system and the remuneration paid to individual members of the Executive Board of Deutsche Börse AG is explained in more detail in the remuneration report.

Organisational structure
The responsibilities of the Chief Executive Officer (CEO) include the Group's strategy, M&A activities, communications, legal affairs as well as regulatory matters, and Group Audit. The duties of the Chief Financial Officer (CFO) comprise, among other things, financial reporting and controlling, risk management, compliance and investor relations. The Trading & Clearing division bundles derivatives trading and the clearing houses of Deutsche Börse Group. The electronic foreign exchange trading platform 360T®, as well as EEX Group, also belong to this division. The Post-Trading, Data & Index division includes Clearstream's settlement and custody business, the reporting segments IFS (Investment Fund Services), and GSF (Collateral Management), as well as the data, index and analytics businesses. Deutsche Börse Group's cash market businesses – comprising the trading venues Xetra, Frankfurt Stock Exchange, and the certificates and warrants business – are assigned to the Cash Market, Pre-IPO & Growth Financing division. The division is also responsible for building up a pre-IPO market, establishing tools for growth financing. Human Resources completes this area of responsibility. The Chief Information Officer/Chief Operating Officer (CIO/COO) division combines Deutsche Börse Group's IT activities and market operations. Technological transformation and digitalisation are the key areas of focus for this division.

Objectives and strategies

Deutsche Börse Group’s objectives and strategies

Deutsche Börse Group is one of the largest market infrastructure providers worldwide. The Group’s business model contributes the capital markets’ stability, efficiency and integrity. This benefits issuers in the form of low costs of raising capital and investors in the form of high liquidity and low transaction costs. At the same time, Deutsche Börse stands for transparent, secure capital markets in which organised trading is based on free price formation.

Deutsche Börse Group's business model is geared towards a diversified product and service offer that covers the entire value chain of financial market transactions. The Group’s diversified business model is based on the following key elements:

- Integrating different financial market services such as trading, clearing, settlement, securities custody, liquidity and collateral management, as well as index, analytics and market data services
- Providing these services for various asset classes such as equities, bonds, funds, commodities, foreign exchange, interest rates, and derivatives products based on these underlyings
- Developing and operating proprietary electronic systems for all processes along the value creation chain
- Organising an impartial marketplace to ensure orderly, supervised trading with fair price formation, plus providing risk management services

In order to maintain and expand its leading position among exchange organisations, Deutsche Börse Group is pursuing the “Roadmap 2020” growth strategy. To achieve this strategic objective, Deutsche Börse is focusing on generating structural, organic growth, while at the same time accelerating non-organic growth through acquisitions in five defined business areas. The third pillar of the strategy is to strengthen and further expand its position in the IT area.

As part of an ongoing process, the Group is reviewing its organic growth initiatives, focusing in particular on expansion into markets and asset classes characterised by structural growth, while attaching great importance to ensuring that the initiatives launched are implemented in a consistent, successful manner. Please refer to the report on opportunities for the key initiatives and growth drivers. Moreover, the remuneration system for the Executive Board and executive staff has created a number of incentives for growth in the individual business divisions. Please refer to the remuneration report for a detailed description of all targets. As far as external growth opportunities are concerned, the focus is on strengthening existing high-growth areas, and on exploring new asset classes and services.

Deutsche Börse has a scalable business model, which permits higher business volumes to be achieved at relatively low additional cost. This means that, with a strong business performance and organic or external growth, revenue growth will exceed cost increases. To reinforce the scalability of its business model, the Group has introduced clear targets for net revenue and profit growth. Based on its current business portfolio, the Group anticipates structurally driven net revenue growth of at least 5 per cent a year between 2017 and 2020. With regard to net income for the period attributable to Deutsche Börse AG shareholders, the Group is targeting an average annual growth rate of 10 to 15 per cent over the same period. So far, during the course of implementing this growth strategy, the Group has managed to achieve or even exceed these targets.

Among the factors that have a significant impact on Deutsche Börse Group's organic growth are:

- Regulatory requirements affecting all market participants: if regulatory initiatives (such as EMIR, MiFIR and CRR/CRD) strengthen the role of exchanges, this will also benefit Deutsche Börse Group.
- Structural changes in the financial markets: e.g. trading activity increases if investment funds make greater use of derivatives to implement their trading strategies.
- Innovative strength: If Deutsche Börse Group succeeds in continuously introducing new products and services for which there is market demand, the Group will be in a position to further expand its business.
- The cyclical nature of financial markets: For example, increased stock market volatility typically leads to higher levels of trading in the cash and derivatives markets, and rising interest rates tend to drive up net interest income and trading volumes in interest rate derivatives.

Deutsche Börse Group is committed to maintaining transparent, reliable and liquid financial markets, although it cannot control the volume drivers for these markets, i.e. cyclical factors. The Group can influence the other factors either wholly or partially; for instance, it can lobby for a favourable legal framework for the financial markets, or it can develop products and services that support clients' business. This also enables it to reduce dependence on those factors beyond its control.

Management approach for a Group-wide commitment to sustainability
One of Deutsche Börse Group's objectives and strategies is to take a holistic approach to corporate responsibility. Its management approach is therefore guided by three action-led principles that aim to sustainably strengthen and preserve the value that Deutsche Börse Group adds to the economy and society:

- Building trust. Deutsche Börse Group aims to organise the capital markets in a way that ensures their integrity, transparency and security. The availability of high-quality information is a key aspect in this process and something that the Group is working on constantly to enhance. In this context, providing sustainability information is as significant as engaging in a constructive dialogue on the future viability of the international capital markets with our customers but also with the general public.
- Leading by example. As a listed service provider, Deutsche Börse Group aims to ensure that its own corporate activities are conducted responsibly and with a view to the future. In addition, the Group pursues a sustainable human resources policy and is committed to the environment and hence to conserving resources. It enhances its commitment to sustainability and related reporting on an ongoing basis in order to establish itself as a long-term role model on the market.
- Increasing public awareness. The Group is part of civil society and as such has a responsibility towards it. It is committed to fulfilling this role both in Germany and in its international locations. It systematically bases its actions on local requirements and, as a good corporate citizen, takes part in long-term cooperative initiatives aimed at strengthening structures in the non-profit sector.

In 2016, Deutsche Börse established a Group Sustainability Board to continuously develop the Group-wide sustainability strategy along the entire value chain and advise the Executive Board on sustainability issues. The Board convenes twice a year and in 2019 its members comprised twelve representatives of the Executive Board divisions, plus the Head of Group Sustainability and one Executive Board member.

Internal management

Management systems

Deutsche Börse Group's internal management system is generally based on key performance indicators taken from the consolidated income statement (net revenue; operating costs excluding depreciation, amortisation and impairment losses; EBITDA; Group's net profit for the period attributable to Deutsche Börse AG shareholders), as well as on various parameters derived from the consolidated statement of financial position and the consolidated statement of cash flows (cash flows from operating activities, liquidity, equity less intangible assets). In addition, the system includes key performance indicators derived from the adjusted income statement and balance sheet (net debt/EBITDA ratio and return on shareholders' equity). Details on the components of the income statement are shown in the table "Consolidated income statement".

The most significant performance indicators to manage the Group's results of operations include the secular net revenue growth and the adjusted net profit for the period attributable to Deutsche Börse AG shareholders. The performance indicators derived from the statement of financial position and the statement of cash flows include cash flows from operating activities and equity less intangible assets. In addition, Deutsche Börse Group's target is to primarily meet its operating liquidity requirements from internal financing with a view towards maintaining sufficient liquidity in order to be able to meet all of the Group's payment obligations when due. There is no set target for the Group's management KPI of equity less intangible assets; rather, the objective is to maintain a positive figure.

At Group level, a net debt/EBITDA ratio not exceeding 1.75 and free funds from operations (FFO) relative to net debt greater than or equal to 50 per cent is also targeted in order to achieve the "minimum financial risk profile" consistent with the current AA rating in accordance with S&P Global Ratings methodology. In addition, an interest coverage ratio of at least 14 is targeted for Deutsche Börse Group using this methodology.

Group projects are prioritised and steered using strategic and financial criteria, taking project-specific risks into account. The main criterion used to assess the strategic attractiveness of projects is their (expected) contribution to the strategic objectives for Deutsche Börse Group and its business areas. The main financial criteria are key performance indicators such as net present value (NPV), the payback period and the return after tax, which are calculated on the basis of the project or business plans, which are calculated on the basis of the project or business plans. Risks are monitored at all levels of project work, i.e. both when prioritising and steering projects and during ongoing project management.

Details concerning the non-financial performance indicators used by Deutsche Börse Group are outlined in the "Combined non-financial statement" section.

Internal control system as part of the financial reporting process

Deutsche Börse has established a Group-wide internal control system (ICS). The ICS comprises rules to manage the company's activities as well as guidelines defining how compliance with these rules is monitored. The principles of the Group-wide ICS are also applied in partially decentralized units of Deutsche Börse Group. Monitoring tasks are implemented through process-integrated measures (such as organisational safeguards and controls) as well as through process-independent measures. All business divisions are responsible for ensuring that Group-wide ICS requirements are met in their respective areas of responsibility.

The purpose of the accounting-related ICS is to ensure orderly accounting practices. The central Financial Accounting and Controlling (FA&C) division, together with decentralised units acting on the requirements set out by FA&C, are responsible for preparing the accounts at Deutsche Börse AG and its consolidated subsidiaries. Group Tax is responsible for determining tax items for accounting purposes. The relevant department heads are responsible for the related processes, including effective security and control measures. The aim is to ensure that risks relating to the accounting process are identified early on, so that remedial action can be taken in good time.

In order to assure uniform and consistent accounting, FA&C provides regularly updated accounting manuals and guidelines and work instructions for the material accounting processes – as part of the preparation of the annual and consolidated financial statements of Deutsche Börse AG. All employees in the FA&C area, as well as in decentral units, have access to these documents and the accounting and account assignment guidelines, allowing them to see for themselves the scope of managerial discretion and accounting options Deutsche Börse Group exercises.

Moreover, Deutsche Börse Group continuously monitors and analyses changes in the accounting environment and adjusts its processes in line with them. This applies in particular to national and international accounting standards.

Another key component of the ICS is the principle of segregation of duties: tasks and authorities are clearly assigned and separated from each other in organisational terms. Incompatible tasks – such as modifying master data on the one hand and issuing payment instructions on the other – are strictly segregated at a functional level. An independent control unit grants individual employees access rights to the accounting system and continuously monitors these permissions using a so-called incompatibility matrix. Transactions are initially recorded in the general ledger or the appropriate sub ledgers on the basis of the chart of accounts and the account allocation guidelines.

Major Deutsche Börse Group subsidiaries maintain and consolidate their general ledgers in the same system. Accounting data from other companies is uploaded for inclusion in the consolidated financial statements. Liabilities, expenses and income for individual transactions are recorded in separate accounts under the name of the counterparty concerned. Any consolidation differences are reviewed centrally and sent to the accounting departments of the companies concerned for clarification.

The processes, systems and controls described above aim to provide reasonable assurance that the accounting system complies with the applicable principles and laws. In addition, Compliance and Internal Audit act as a further line of defence, performing risk-based, process-independent controls on whether the ICS is appropriate and effective. The Executive Board and the Audit Committee established by the Supervisory Board receive regular reports on the effectiveness of the ICS with respect to the financial reporting process.

Takeover-related disclosures

Disclosures in accordance with sections 289a (1) and 315a (1) of the German Commercial Code (HGB)and explanatory notes
In accordance with sections 289a (1) and 315a (1) of the German Commercial Code (HGB, Handelsgesetzbuch), in conjunction with section 83 (1) sentence 2 of the Introductory Act to the German Commercial Code (EGHGB, Einführungsgesetz zum Handelsgesetzbuch), Deutsche Börse AG hereby makes the following disclosures as at 31 December 2019:

The share capital of Deutsche Börse AG amounted to €190.0 million on the above-mentioned reporting date and was composed of 190 million no-par value registered shares. There are no other classes of shares besides these ordinary shares.

The share capital has been contingently increased by up to €17.8 million by issuing up to 17.8 million no-par value registered shares (contingent capital 2019). The contingent capital increase will only be implemented to the extent that holders of convertible bonds or of warrants attaching to bonds with warrants issued by the Company or by a Group company in the period until 7 May 2024 on the basis of the authorisation granted to the Executive Board by resolution of the Annual General Meeting of 8 May 2019 on Item 8 (b) of the agenda exercise their conversion or option rights, that they meet their conversion or option obligations, or that shares are tendered, and no other means are used to settle such rights or obligations. More details can be found in Article 4 (7) of the Articles of Association of Deutsche Börse AG.

The Executive Board is only aware of those restrictions on voting rights that arise from the Aktiengesetz (AktG, German Stock Corporation Act). Therefore, those shares affected by section 136 of the AktG are excluded from voting rights. Furthermore, shares held by Deutsche Börse AG as treasury shares are exempted from the exercise of any rights according to section 71b of the AktG.

Under the Wertpapierhandelsgesetz (WpHG, German Securities Trading Act), any investor whose shareholding reaches, exceeds or falls below specified voting right thresholds as a result of purchase, sale or any other transaction is required to notify the company and the Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin, German Federal Financial Supervisory Authority). The lowest threshold for this disclosure requirement is 3 per cent. Deutsche Börse AG is not aware of any direct or indirect equity interests in its capital exceeding 10 per cent of the voting rights.

There are no shares with special rights granting the holder supervisory powers.

Employees holding shares in Deutsche Börse AG exercise their rights in the same way as other shareholders in accordance with the statutory provisions and the Articles of Association.

Members of the Executive Board are appointed and dismissed in accordance with sections 84 and 85 of the AktG and with Article 6 of the Articles of Association of Deutsche Börse AG. Amendments to the Articles of Association of Deutsche Börse AG are adopted by resolution of the Annual General Meeting in accordance with section 119 (1) No. 6 of the AktG (amended). Under Article 12 (4) of the Articles of Association of Deutsche Börse AG, the Supervisory Board has the power to make changes to the Articles of Association that relate to the wording only. In accordance with Article 18 (1) of the Articles of Association of Deutsche Börse AG, resolutions of the Annual General Meeting are passed by a simple majority of the votes cast, unless otherwise mandated by the AktG. Insofar as the AktG additionally prescribes a majority of the share capital represented at the time of a resolution, a simple majority of the share capital represented is sufficient where this is legally permissible.

Subject to the approval of the Supervisory Board, the Executive Board is authorised to increase the share capital by up to a total of €13.3 million on one or more occasions in the period up to 10 May 2021 by issuing new no-par value registered shares in exchange for cash and/or non-cash contributions (authorised capital I). Shareholders must be granted pre-emptive rights. However, subject to approval by the Supervisory Board, the Executive Board may exclude shareholders' pre-emptive rights with respect to fractional amounts. According to the authorisation, however, the Executive Board may only exclude shareholders' pre-emptive rights if the total number of shares issued during the term of authorisation and that exclude shareholders' pre-emptive rights does not exceed 20 per cent of the share capital. Full authorisation, and particularly the conditions under which shareholders' pre-emptive rights can be excluded, is derived from Article 4 (3) of the Articles of Association of Deutsche Börse AG.

The Executive Board is also authorised to increase the share capital by up to a total of €19.3 million on one or more occasions in the period up to 12 May 2020, subject to the approval of the Supervisory Board, by issuing new no-par value registered shares against cash and/or non-cash contributions (authorised capital II). Shareholders must be granted pre-emptive rights, which the Executive Board can disapply in certain cases, subject to the approval of the Supervisory Board in each case. The Executive Board is authorised to exclude shareholders' pre-emptive rights: (1) in the case of cash capital increases, provided that the issue price of the new shares is not significantly lower than the prevailing exchange price, and the total number of shares issued under exclusion of shareholders' pre-emptive rights does not exceed 10 per cent of the share capital; (2) in the case of physical capital increases in exchange for non-cash contributions for the purpose of acquiring companies, parts of companies, interests in companies, or other assets; or (3) with respect to fractional amounts. However, according to the authorisation, the Executive Board may only exclude shareholders' pre-emptive rights if the total number of shares that are issued during the term of authorisation and that exclude shareholders' pre-emptive rights does not exceed 20 per cent of the share capital. Full authorisation, and particularly the conditions under which shareholders' pre-emptive rights can be excluded, is derived from Article 4 (4) of the Articles of Association of Deutsche Börse AG.

In addition, the Executive Board is authorised to increase the share capital by up to a total of €38.6 million on one or more occasions in the period up to 12 May 2020, subject to the approval of the Supervisory Board, by issuing new no-par value registered shares in exchange for cash contributions (authorised capital III). Shareholders must be granted pre-emptive rights, which the Executive Board can exclude, subject to the approval of the Supervisory Board, only for fractional amounts. However, according to the authorisation, the Executive Board may only exclude shareholders' pre-emptive rights if the total number of shares that are issued during the term of authorisation and that exclude shareholders' pre-emptive rights does not exceed 20 per cent of the share capital. The exact content of this authorisation is derived from Article 4 (5) of the Articles of Association of Deutsche Börse AG.

Furthermore, the Executive Board is authorised to increase the share capital by up to a total of €6.0 million on one or more occasions in the period up to 16 May 2022, subject to the approval of the Supervisory Board, by issuing new no-par value registered shares against cash and/or non-cash contributions (authorised capital IV). Shareholders must be granted pre-emptive rights unless the Executive Board makes use of the authorisation granted to it to disapply such rights, subject to the approval of the Supervisory Board. The Executive Board is authorised to disapply shareholders' pre-emptive rights for fractional amounts with the approval of the Supervisory Board. However, according to the authorisation, the Executive Board may only exclude shareholders' pre-emptive rights if the total number of shares issued during the term of the authorisation, excluding pre-emptive rights, does not exceed 20 per cent of the share capital. Full authorisation is derived from Article 4 (6) of the Articles of Association of Deutsche Börse AG.

The Executive Board is authorised to acquire treasury shares up to 10 per cent of the share capital. However, the acquired shares, together with any treasury shares acquired for other reasons that are held by the Company or attributed to it in accordance with sections 71a et seq. of the AktG, may at no time exceed 10 per cent of the Company's share capital. The authorisation to acquire treasury shares is valid until 7 May 2024 and may be exercised by the company in full or in part on one or more occasions. However, it may also be exercised by dependent companies, by companies in which Deutsche Börse AG holds a majority interest or by third parties on its or their behalf. The Executive Board may elect to acquire the shares (1) on the stock exchange, (2) via a public tender offer addressed to all shareholders or via a public request for offers of sale addressed to the company's shareholders, (3) by issuing tender rights to shareholders or (4) using derivatives (put options, call options, forward purchases or a combination of put options, call options and forward purchases). The full and exact wording of the authorisation to acquire treasury shares, and particularly the permissible uses to which the shares may be put, can be found in items 6 and 7 of the agenda for the Annual General Meeting held on 8 May 2019.

The following material agreements of the Company are subject to a change of control following a takeover bid:

- On 28 March 2017, Deutsche Börse AG and its subsidiary Clearstream Banking S.A. entered into a multicurrency revolving facility agreement with a banking syndicate for a working capital credit totalling up to €750.0 million. If there is a change of control, the credit relationship between Deutsche Börse AG and the lenders can be reviewed in negotiations within a period of no more than 60 days. In this process, each lender has the right, at its own discretion, to terminate its credit commitment and demand partial or full repayment of the amounts owing to it. A change of control occurs if Deutsche Börse AG no longer directly or indirectly holds the majority of Clearstream Banking S.A. or if a person or a group of persons acting in concert acquires more than 50 per cent of the voting shares of Deutsche Börse AG.
- Under the terms of Deutsche Börse AG's €600.0 million fixed-rate bond issue 2015/2041 (hybrid bond), Deutsche Börse AG has a termination right in the event of a change of control which, if exercised, entitles Deutsche Börse AG to redeem the bonds at par, plus accrued interest. If Deutsche Börse AG does not exercise this termination right, the affected bonds' coupon will increase by 5 percentage points. A change of control occurs if a person or a group of persons acting in concert, or third parties acting on their behalf, has or have acquired more than 50 per cent of the shares of Deutsche Börse AG or the number of Deutsche Börse AG shares required to exercise more than 50 per cent of the voting rights at Annual General Meetings of Deutsche Börse AG. In addition, the relevant bond terms require that the change of control must adversely affect the long-term rating given to Deutsche Börse AG by Moody's Investors Services, Inc., S&P Global Ratings or Fitch Ratings Limited. Further details can be found in the applicable bond terms.
- The terms of the €500.0 million fixed-rate bonds 2015/2025, the €600.0 million fixed-rate bonds 2018/2028, and the €600.0 million fixed-rate bonds 2012/2022, which were all issued by Deutsche Börse AG, all provide Deutsche Börse AG with a termination right in the event of a change of control. If these cancellation rights are exercised, the bonds are repayable at par plus any accrued interest. A change of control occurs if a person or a group of persons acting in concert, or third parties acting on their behalf, has or have acquired more than 50 per cent of the shares of Deutsche Börse AG or the number of Deutsche Börse AG shares required to exercise more than 50 per cent of the voting rights at Annual General Meetings of Deutsche Börse AG. In addition, the respective sets of bond terms require that the change of control must adversely affect the rating given to one of the preferential unsecured debt instruments of Deutsche Börse AG by Moody's Investors Services, Inc., S&P Global Ratings or Fitch Ratings Limited. Further details can be found in the applicable bond terms.
- Based on the previous remuneration system for Executive Board members presented to the Annual General Meeting 2016, under certain conditions the Executive Board members of Deutsche Börse AG

have a special termination right in the event of a change of control. According to the agreements made with all Executive Board members, a change of control occurs if (1) a shareholder or third party discloses possession of more than 50 per cent of the voting rights in Deutsche Börse AG in accordance with sections 33 and 34 of the German Securities Trading Act (WpHG), (2) an intercompany agreement in accordance with Section 291 of the AktG is entered into with Deutsche Börse AG as a dependent company, or Deutsche Börse AG is absorbed in accordance with section 319 of the AktG, or (3) Deutsche Börse AG is merged in accordance with Section 2 of the German Transformation Act (UmwG).

Moreover, there are agreements in place with the Executive Board members under the existing remuneration system, which provide for compensation in the event of a change of control. A description of these agreements, which are in line with national and international practice, can be found in the remuneration report.

Report on economic position

Macroeconomic and sector-specific environment

Macroeconomic conditions continue to have an influence on the business development of Deutsche Börse Group despite the growing importance of structural growth factors. The macroeconomic environment during the year under review was rather complex; whilst some factors had a stimulating effect on business, other factors unsettled market participants, dampening their business activity:

- The global economic situation, with a slight downward trend in economic output in the economies relevant to Deutsche Börse Group (Central Europe, USA) in the year under review. The European Central Bank's (ECB) continued persevering of its low-interest-rate policy, with deposit rates at minus 0.5 per cent, and the resumption of its bond-buying programme as part of its quantitative easing policy (QE).
- The US Federal Reserve's (Fed) monetary policy measures to counteract a possible economic downturn, which were accompanied by interest rate cuts of 25 basis points each in July, September and October.
- The lower level of stable volatility on equity markets – as measured by the VDAX® index – is one of the key drivers of trading activity on the cash and derivatives markets.
- The stability of the economic situation in the euro area continued over the course of the year, although the economic outlook became increasingly gloomy, particularly in the second half of 2019. This was accompanied by persistent uncertainty regarding the terms of the United Kingdom's withdrawal from the EU and its impact on markets.
- The trade dispute between the US and the EU, China, and other major trading partners, and the trade tariffs imposed on commodity or goods imports by the respective parties, fuelled concerns over a global trade war.
- Continued unstable political conditions in some parts of Eastern Europe and recurring flashpoints in the Arab world and their impact on the Western world.
- Regulatory projects and the resulting stricter requirements for capital market participants

Business developments

Given the overall framework conditions described at the beginning of the report on the economic position, the situation on the capital markets for financial service providers such as Deutsche Börse Group in the reporting year was challenging compared with the previous year. Already at the beginning of 2019, it was anticipated that this year would see a cooling of the global economic environment, which proved to be the case as the year progressed. The main reasons for this were the trade disputes between the US and the EU, China and other major trading partners, and the penalty tariffs imposed by the respective parties on the import of raw materials and goods. As concerns about a global trade war deepened, expectations as to the economy in general became dampened – especially expectations for Germany, an economy with a particular dependence on global trade. Despite market uncertainty, the volatility measured by the VDAX volatility index – one of the main drivers of trading activity on the cash and derivatives markets – was on average slightly below that of the previous year, apart from a few short-term peaks. Meanwhile, despite lower trading volumes compared with the previous year, the DAX and STOXX® benchmark indices saw a significant increase in their levels by the end of the year. Central banks' interest rate policies stimulated the market environment considerably. The US Fed’s monetary policy easing had a negative impact on net interest income from banking business from the second half of the year onwards.

Comparability of figures

Changes in the basis of consolidation

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 index businesses to form Qontigo, a newly established company 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 company since 13 September 2019. Revenue and costs are reported in the Qontigo segment (Index and analytics business). In this context, certain licence revenues from the Data segment (data business) were also re-allocated to the new Qontigo segment, which amounted to €10.1 million for the first nine months of 2019. The previous year's figures were also adjusted accordingly (€12.8 million).

Changes to the consolidated income statement and to the consolidated balance sheet due to the recognition of leases in accordance with IFRS 16

Deutsche Börse Group adjusted the structure of its financial statements as at 1 January 2019 in accordance with IFRS 16. It now recognises the type of expenses for certain leases described in note 3 to the consolidated financial statements. Since 1 January 2019 these have no longer been reported under operating costs but as part of depreciation, amortisation and the financial result. Given that the prior year’s figures were not restated, IFRS 16 leads to a decline in operating costs year-on-year for the 2019 financial year, while EBITDA, depreciation and amortisation increase and the financial result decreases. As a result of the recognition of right-of-use assets from leases and taking into account any deferred taxes recognised in this context, total assets have risen by €265.6 million overall as at 1 January 2019.

In order to make the results for the 2019 financial year comparable with the figures of the previous year, the following table provides estimates for a retrospective application of IFRS 16. These figures have not been prepared or audited pursuant to national or international accounting standards, but merely serve to provide a better overview of the Group’s business development.

Estimates for the shift of operating costs to depreciation and amortisation as well as to the financial result for 2018 as a result of the first-time application of IFRS 16

	2018 € m
Group	
Reduction of operating costs	50.3
Increase of depreciation and amortisation	47.2
Reduction of financial result	2.9
Reporting segments (reduction of operating costs)	
Eurex (financial derivatives)	11.6
EEX (commodities)	3.3
360T (foreign exchange)	1.1
Xetra (cash equities)	4.2
Clearstream (post-trading)	19.3
IFS (investment fund services)	4.6
GSF (collateral management)	2.4
Qontigo (index- and analytics business)	1.7
Data	2.1

Results of operations

Deutsche Börse Group looks back on another successful financial year. Almost all segments contributed to this success, some of them achieving substantial revenue growth. The Group achieved structural net revenue growth of 5 per cent for the year overall, in line with expectations. The Eurex (financial derivatives) and EEX (commodities) segments were the main drivers of this development. In addition to over-the-counter (OTC) clearing, structural growth of net revenues in the Eurex segment (financial derivatives) was mainly due to new products and pricing models, whilst in the EEX segment (commodities, the positive development of the structural net revenue growth reflected significant market share gains in Europe and the US. The Qontigo (index and analytics business, 360T (foreign exchange trading) and IFS (investment fund services) segments also contributed to strong structural growth. Cyclical effects were unable to drive the Group's growth any further compared to the previous year and broadly offset each other over the period. Higher net interest income from banking business (Clearstream, post-trading segment) made a positive contribution to growth. This was offset by lower volatility on the financial markets compared to the previous year, reflected in a slightly lower trading volume in financial derivatives (Eurex segment). Consolidation effects – mainly resulting from the acquisitions of Axioma and Swisscanto – contributed around 1 per cent to higher net revenue. Overall, the Group generated net revenue of € 2,936.0 million an increase of 6 per cent compared to the previous year (2018: €2,779.7 million).

The reclassification of expenses due to IFRS 16 impacted on the operating costs and EBITDA, as well as on depreciation, amortisation and impairment, and on the financial result. For details, please refer to the note 3 to the consolidated financial statements.

Operating costs for Deutsche Börse Group of €1,264.4 million (2018: €1,340.2 million) comprise staff costs and other operating expenses. Higher expenditure for investments in new technologies and growth initiatives was partially offset by the changeover to IFRS 16. Non-recurring effects totalled €134.9 million for 2019 (2018: €244.2 million) and led to adjusted operating costs of €1,129.5 million (2018: €1,096.0 million). Following adjustments to the previous year's figures in accordance with IFRS 16, adjusted operating costs rose by 8 per cent, mainly due to higher capital expenditure and consolidation effects. Excluding consolidation effects, adjusted operating costs increased by 5 per cent.

Adjusted staff costs increased year-on-year to €705.7 million (2018: €665.8 million). The increase was mainly due to higher average staff numbers, due in part to acquisitions. Non-recurring effects of €42.1 million (2018: €158.2 million) attributed to personnel expenses mainly include costs incurred for efficiency measures in the context of the Structural Performance Improvement Programme (SPIP) introduced in 2018.

Other adjusted operating expenses relate mainly to the costs of enhancing and operating Deutsche Börse Group's technological infrastructure. This includes, for example, costs for the Group's own IT and for external IT service providers. In addition, other operating expenses include the cost of the office infrastructure at all the Group’s locations as well as travel expenses, most of which are incurred in connection with sales activities. Adjusted operating costs fell slightly year-on-year to €423.8 million (2018: €430.2 million). This figure does not include non-recurring effects of €92.8 million (2018: €86.0 million), which resulted from organisational restructuring measures within the scope of implementing the corporate strategy "Roadmap 2020", for example, as well as M&A activities.

Results from strategic investments rose slightly to €6.7 million (2018: €4.2 million).

Earnings before interest, tax, depreciation and amortisation (EBITDA) rose by 16 per cent. Adjustment of the previous year's figures to reflect the adoption of IFRS 16 resulted in an increase in adjusted EBITDA of 5 per cent.

The Group reports depreciation, amortisation and impairment losses separately from operating costs. This figure increased by 7 per cent year-on-year to €226.2 million (2018: €210.5 million) and is mainly due to the reclassification of expenses in accordance with IFRS 16.

The financial result totalled €–53.7 million (2018: €–76.4 million). This decrease was mainly due to lower provisions for interest payments on any potential tax back payments for the 2019 financial year.

The adjusted Group tax rate for 2019 was 26 per cent, as expected.

Overall, the net profit for the period attributable to Deutsche Börse AG shareholders was €1,003.9 million (2018: €824.3 million), an increase of 22 per cent on last year's result. Adjusted, this amounted to €1,105.6 million (2018: €1,002.7 million), an increase of 10 per cent.

Non-controlling interests in net profit attributable to Deutsche Börse AG shareholders amounted to €31.5 million for the period (2018: €28.2 million). This comprises mainly earnings attributable to non-controlling shareholders of EEX Group and, since September 2019, Qontigo GmbH.

Based on the weighted average of 183.4 million shares, basic earnings per share amounted to €5.47 (2018: €4.46 for an average of 184.9 million shares outstanding). Adjusted, basic earnings per share rose to €6.03 (2018: €5.42).

Comparison of results of operations with the forecast for 2019

For 2019, Deutsche Börse Group had expected an increase in structural net revenue of at least 5 per cent on the basis of its diverse structural growth initiatives. The Group expected a slightly more reticent market environment in the 2019 financial year compared to 2018, due to the slowdown in global economic growth, increased economic risks and political uncertainties, especially with regard to further cyclical growth. However, despite the continuing uncertainty, it became less of a factor for financial markets as the year progressed, resulting in stock market volatility, measured by the VSTOXX volatility index, and thus trading volumes falling short of the higher comparative figures for the previous year. In particular, the Group did not expect US interest rates to drop in the second half of 2019. The conditions described earlier in the "Business developments" section thus largely reflect the Group's assumptions used in the forecast. Based on its highly diversified business model, Deutsche Börse Group increased net revenue by a total of 6 per cent. Of this increase, 5 per cent is attributable to structural growth factors, with cyclical factors generally offsetting each other. One per cent of this growth is attributable to consolidation effects. The structural growth forecast was therefore met.

The Group anticipated an increase in structural net revenue of at least 5 per cent, along with operating costs in a range corresponding to this. Deutsche Börse Group had expected an increase in adjusted net profit attributable to Deutsche Börse AG shareholders of around 10 per cent. On an adjusted basis, Deutsche Börse Group achieved a 10 per cent increase in adjusted net profit for the period attributable to Deutsche Börse AG shareholders, in line with the forecast. Moreover, the Group achieved a ratio of net debt to adjusted EBITDA of 1.0, which is well below the target value of 1.75 maximum. The adjusted tax rate was 26.0 per cent, exactly on target. In line with projections, the operating cash flow was clearly positive. Investments in property, plant and equipment, as well as intangible assets amounted to €184.7 million, slightly higher than forecast. After increasing its target figures, the Group aimed to distribute dividends equivalent to the mean of the projected range of 40 to 60 per cent of (adjusted) net profit for the period attributable to Deutsche Börse AG shareholders. According to the proposal made to the Annual General Meeting, based on a proposed dividend of €2.90 per share, a figure of 48 per cent was reached.

Eurex (financial derivatives) segment

Eurex (financial derivatives) segment: key indicators

	2019	2018	Change
FINANCIAL KEY FIGURES	**€m**	**€m**	**%**
Net revenue	957.1	936.1	2
Equity index derivatives	484.0	466.2	4
Interest rate derivatives	210.9	231.9	–9
Equity derivatives	51.1	43.8	17
OTC clearing (incl. net interest income on margins for OTC interest rate swaps)	41.2	25.6	61
Margin fees	52.3	50.0	5
Other (incl. connectivity, member fees and net interest income on margins for exchange-traded products)	117.6	118.6	–1
Operating costs	314.5	376.3	–16
Operating costs (adjusted)	296.0	304.9	–3
EBITDA	647.6	559.4	16
EBITDA (adjusted)	666.2	630.8	6
PERFORMANCE INDICATORS			
Financial derivatives: trading volumes on Eurex Exchange	**m contracts**	**m contracts**	**%**
Derivatives[1]	1,947.1	1,951.8	0
Equity index derivatives	953.0	949.8	0
Interest rate derivatives	506.8	628.5	–11
Equity derivatives	425.2	372.1	14
Financial derivatives: OTC clearing volumes	**€bn**	**€bn**	**%**
Notional outstanding (average)	12,795	7,027	82
Notional cleared (incl. compression)	28,064	15,099	85

1) Due to other traded products, such as exchange-traded commodities (ETCs) on precious metals derivatives, the total shown does not equal the sum of the individual figures

In the Eurex (financial derivatives) segment, Deutsche Börse Group combines the financial derivatives trading and clearing business at Eurex Exchange. The clearing volume of OTC interest rate swaps, one of the structural growth factors for Deutsche Börse Group, is reported as a separate item within the segment. The performance of the Eurex segment largely depends on the trading activities of institutional investors, and proprietary trading by professional market participants.

Trading volumes in the Eurex segment across all product groups reached 1,947.1 million contracts in the 2019 financial year, coming very close to the previous year's figure of 1,951.8 million contracts. The importance of geopolitical influences on the markets, such as the trade dispute between the US and China and the delays surrounding Brexit, eased increasingly in the course of 2019. Accordingly, equity market volatility in the 2019 financial years, as measured by the VSTOXX volatility index, was 10 per cent lower on average than the high figure for the previous year. Despite what was an unfavourable market environment overall, trading volumes in the business with equity index derivatives in the year under review were up slightly on the previous year. Higher contract volumes were evident in sector index trading, particularly for products based on MSCI indices. The Eurex segment benefited here from the considerably broader range of products offered. Single-stock derivatives trading volumes rose by 14 per cent in 2019, due above all to higher contract volumes in derivatives on bank shares.

By contrast, trading volumes in interest rate derivatives declined by 11 per cent in the 2019 financial year. Volumes were burdened here by the absence of further interest rate increases in the US at the start of 2019, as anticipated by many market participants. Instead, the US Federal Reserve (Fed) lowered its key interest rates three times in 2019. In conjunction with the loose monetary policy still pursued by the ECB, this led to a decline in trading volumes in Europe, especially in the longer maturities.

The Eurex segment achieved marked growth of 480 per cent in trading in commodity ETFs, so-called exchange traded commodities (ETCs), albeit from a low absolute level. The option on the physical gold ETC in particular offers investors an opportunity to gain exposure to a proxy for gold spot volatility. ETC trading volumes totalled 8.1 million contracts in 2019 (2018: 1.4 million).

Clearing of OTC interest rate derivatives continued to increase in the 2019 financial year, with the outstanding nominal volume exceeding the previous year's value by 63 per cent. Eurex Clearing's market share in global euro-denominated OTC interest rate derivatives rose accordingly to 14.5 per cent (2018: 9.3 per cent). The incentive programme that Eurex introduced in September for transferring interest rate derivative portfolios to Eurex Clearing also had a positive effect, helping Eurex clients migrate their positions into the EU-27. Cleared nominal volumes rose by 85 per cent in 2019.

At the start of 2019, Eurex Clearing's Partnership Programme was extended to include the repo segment, with the objective of enhancing selection and efficiency for market participants in special repos and general collateral (GC) instruments, as well as furthering acceptance and growth in repo business between traders and customers. At the end of 2019, more than 300 end clients (2018: 130) were connected to Eurex Clearing's interest rate derivatives service. Increased buy-side demand is proof of the trust our clients place in the quality of euro clearing based in Frankfurt.

Overall, net revenue in the Eurex segment increased by a total of 2 per cent in 2019. The biggest growth drivers in percentage terms were OTC clearing and the business with equity derivatives. Trading in equity index derivatives, measures by the net revenues of the most important business, reported a 4 per cent increase in revenue. The segment's adjusted EBITDA rose by 6 per cent.

EEX (commodities) segment

EEX (commodities) segment: key indicators

	2019	2018	Change
FINANCIAL KEY FIGURES	€m	€m	%
Net revenue	289.3	256.6	13
Power spot	70.9	67.1	6
Power derivatives	105.1	82.1	28
Gas	42.8	36.6	17
Other (incl. connectivity, member fees and admission allowance)	70.5	70.8	0
Operating costs	169.6	149.2	14
Operating costs (adjusted)	150.6	141.2	7
EBITDA	119.4	107.2	11
EBITDA (adjusted)	138.4	115.2	20
PERFORMANCE INDICATORS			
Commodities: trading volumes on EEX	TWh	TWh	%
Power spot	597.7	576.6	4
Power derivatives	5,829.7	4,385.5	33
Gas	2,546.3	1,962.9	30

The EEX (commodities) segment comprises Deutsche Börse Group's trading activities on EEX Group's platforms, located in Europe, Asia and North America. The EEX Group operates marketplaces and clearing houses for energy and commodity products, connecting more than 600 participants around the world. The product portfolio comprises contracts on energy, metals and environmental products, as well as freight and agricultural products. EEX Group's most important revenue drivers are the power spot and derivatives markets, and the gas markets.

EEX Group cemented its position further in 2019 as a global commodities exchange, achieving marked growth especially in the markets for electricity, natural gas and freight.

The Group increased its trading volume in the spot power market by 4 per cent in 2019. Growth was attributable mainly to increases in the German and Austrian day-ahead markets, and from greater volume in the intraday markets, due in part to the higher share of renewable energy. On the other hand, the introduction of a joint order book – and hence, the coupling of the day-ahead markets in Germany, Austria, the Netherlands, Belgium and France at the start of July 2019 – drove up competitive pressure.

EEX Group's power derivatives markets saw an increase in trading volumes of 33 per cent to 5,829.7 TWh. Trading in Phelix-DE futures continued to expand and reached a new record volume of 250.1 TWh in September 2019. EEX Group also significantly increased its trading volume and further extended its market share in 2019 on the power derivatives markets in France, Spain and Hungary. EEX rolled out new power products at the start of June 2019 for three southern European markets. comprising cash-settled power futures for Bulgaria, Serbia and Slovenia. With the new products, EEX's range of power products now covers 20 European market areas. US power trading, operated by Nodal Exchange which was acquired in 2017, increased its volume by 79 per cent in 2019. Nodal Exchange reported a new record volume of 231 TWh in October 2019, while its market share of the North American power derivatives market climbed to 36 per cent in the year under review (2018: 21 per cent).

In the gas market, trading volume of the EEX segment rose by 30 per cent. High growth rates were achieved in the gas spot market in the Netherlands, Germany and Austria in particular. Trading activity on the gas derivatives market increasingly gained momentum during 2019, driven especially by the Dutch and the German market.

2019 was a very positive year for the freight segment, with freight volumes settled via the ECC clearing house climbing in 2019 by 109 per cent year-on-year.

Across all product groups, net revenue of the EEX segment rose by 13 per cent in the year under review. Adjusted EBITDA rose by 20 per cent.

360T (foreign exchange) segment

360T (foreign exchange) segment: key indicator

	2019	2018	Change
FINANCIAL KEY FIGURES	€m	€m	%
Net revenue	92.1	78.8	17
Trading	76.9	66.7	15
Other (incl. connectivity and member fees)	15.2	12.1	26
Operating costs	57.7	49.9	16
Operating costs (adjusted)	50.4	45.7	10
EBITDA	34.4	28.9	19
EBITDA (adjusted)	41.7	33.1	26
PERFOMANCE INDICATORS			
Foreign exchange: trading volumes on 360T®	**€bn**	**€bn**	**%**
Average daily volume	82.5[1]	69.2[1]	19

1) Including GTX trading volumes since July 2018

In the 360T (foreign exchange) segment, Deutsche Börse Group manages its foreign exchange trading business, which takes place on the platforms provided by its subsidiaries 360 Treasury Systems AG and 360TGTX Inc. Net revenue of the 360T segment is driven mainly by the trading activities of institutional investors, banks and internationally active companies, and the provision of liquidity through so-called liquidity providers. During the year under review, the segment generated 83 per cent of its revenue from foreign-exchange trading and 17 per cent from the provision of other services.

The market environment in the 360T segment was determined by low volatility overall on the FX spot markets during the year under review. Despite this cyclical headwind, the 360T segment was nonetheless able to increase average daily trading volumes on its platform by 19 per cent during the 2019 financial year. Growth in trading volumes was based primarily on the acquisition and onboarding of new clients, in particular in the US, as well as in the EMEA and APAC regions. Strong growth was recorded in the year under review, above all in swaps and forward transactions. The OTC product range was also extended in the year under review with the introduction of a fully-automated limit order book for FX swaps (360TGTX MidMatch) and a streaming service for non-deliverable forwards (NDFs).

In addition, Eurex's FX trading and clearing activities, which are also allocated to the 360T segment, reached important milestones in the planned expansion of the product and service range. This led to the acquisition of two renowned US banks – J.P. Morgan and Morgan Stanley – as the first participants for the OTC FX clearing service. The first cross-currency swaps were successfully cleared via Eurex Clearing in October. Eurex Clearing's ITC-FX clearing service offers interdealer clearing of EUR/USD and GBP/USD currency pairs for cross-currency swaps with a term of up to 50 years. The Eurex business with FX-based exchange-traded derivatives (ETDs) was another of the segment's initiatives. Further renowned clearing members, liquidity providers and trading participants were acquired as clients for Eurex FX futures trading in the year under review. The volume of FX futures traded on the Eurex platform grew steadily in 2019 to reach a record volume of 32,540 traded contracts on 11 December 2019. Open interest at year-end 2019 reached a new all-time high of €2.04 billion. The market data product, which was rolled out together with the Data segment in 2018 and provides data on both FX spot and swap markets, continued to be very well received by market participants last year and developed positively.

Given the product mix, which comprises a higher share of lower-margin products, net revenue growth of 17 per cent for the 2019 financial year fell slightly short of the increase in trading volumes. The GTX business (acquired in the previous year) contributed 12 percentage points to revenue growth over the year as a whole. The 360T segment's adjusted EBITDA rose by 26 per cent.

Xetra (cash equities) segment

Xetra (cash equities) segment: key indicators

	2019	2018	Change
FINANCIAL KEY FIGURES	€m	€m	%
Net revenue	222.6	228.7	–3
Trading and clearing	156.4	170.6	–8
Listing	19.9	17.8	12
Other (incl. connectivity and member fees)	46.3	40.3	15
Operating costs	101.7	118.8	–14
Operating costs (adjusted)	98.1	102.7	–4
EBITDA	124.8	115.5	8
EBITDA (adjusted)	128.4	131.6	–2
PERFORMANCE INDICATORS	€bn	€bn	%
Trading volume (single-counted order book turnover at the trading venues Xetra®, Börse Frankfurt and Tradegate)	1,500.3	1,719.6	–13
Equities	1,354.9	1,552.7	–13
ETF/ETC/ETN	145.4	166.9	–13

In the Xetra segment (cash equities), Deutsche Börse Group brings together its cash market trading venues (Xetra®, the Frankfurt Stock Exchange, and Tradegate). Besides trading and clearing services income, the segment generates revenue from the ongoing listing of companies' securities and exchange admissions, from connecting clients to trading venues, and from services provided to partner exchanges.

Low equity market volatility in the 2019 financial year was the main reason for the unfavourable cyclical environment for Deutsche Börse Group's cash market business. The higher index levels compared with the previous year were unable to offset the lower trading activity, so that trading volumes fell by 13 per cent in the year under review. Competing with other pan-European trading venues, Xetra nonetheless further strengthened its position as the reference market for trading in DAX® constituents, increasing its market share to 71 per cent (2018: 68 per cent). Trading volumes in exchange-traded funds (ETFs) were also down 13 per cent year-on-year. Assets under management in ETFs totalled €709.8 billion as at 31 December 2019 (2018: €524.2 billion).

During the year under review, the Xetra segment recorded a total of four initial public offerings (IPOs) compared with 18 in 2018. These included the IPOs of TRATON SE, the Volkswagen Group's commercial vehicles business, with an issue volume of €1.6 billion and TeamViewer AG with an issue volume of €2.2 billion. TeamViewer's IPO was the largest of a technology company in Germany since 2000.

Persistently high investor interest in Xetra-Gold® – a bearer bond backed by physical gold – led to new record levels, both in terms of gold holdings and assets under administration. At the end of the financial year 2019, the gold held in custody reached a record of 203.2 tonnes (2018: 181.4 tonnes), equivalent to around €8.8 billion (2018: €6.5 billion). Xetra Gold thus remains the leading European security backed by physical gold. In the year under review, the aggregate order book turnover was €3.4 billion (2018: €2.7 billion), making Xetra Gold the most actively traded instrument amongst exchange traded commodities (ETCs) traded on Xetra.

Net revenue in the Xetra segment declined slightly by 3 per cent during the year under review. The below-average decline in revenue from trading and clearing services compared with the performance of trading volume resulted from Deutsche Börse's rebate and pricing model, i.e. lower volume discounts are granted for lower trading volumes. Higher listing fees also had a positive impact on net revenue. The increase in other revenue was attributable to higher connectivity fees and resulted above all from numerous clients developing their infrastructure in preparation for the UK's exit from the EU. The segment's adjusted EBITDA also fell slightly by 2 per cent.

Clearstream (post-trading) segment

Clearstream (post-trading) segment: key indicators

	2019	2018	Change
FINANCIAL KEY FIGURES	€m	€m	%
Net revenue	764.7	727.3	5
Custody	391.7	382.8	2
Settlement	82.2	76.0	8
Net interest income from banking business	188.2	155.5	21
Third-party services	24.3	32.1	–24
Other (incl. connectivity, account maintenance)	78.3	80.9	–3
Operating costs	305.0	351.9	–13
Operating costs (adjusted)	282.4	277.7	2
EBITDA	459.4	375.2	22
EBITDA (adjusted)	482.0	440.1	10
PERFORMANCE INDICATORS			%
Assets under custody ICSD and CSD (average) (€bn)	11,561	11,302	2
Settlement transactions ICSD (m)	56.1	48.4	16
Cash balances (daily average) (€bn)	15.7	13.1	20

Deutsche Börse Group's settlement and custody activities are reported under the Clearstream (post-trading) segment. In providing the post-trade infrastructure for Eurobonds and other markets, Clearstream is responsible for the issuance, settlement, management and custody of securities from more than 50 markets worldwide. Net revenue in this segment is driven mainly by the volume and value of securities under custody, which determines the deposit fees. The settlement business depends primarily on the number of settlement transactions processed by Clearstream via stock exchanges as well as over the counter (OTC). This segment also contains the net interest income originating from Clearstream's banking business.

The average value of assets under custody in the central securities depository (CSD) and international central securities depository (ICSD) business increased by 2 per cent in the 2019 financial year. This rise was mainly due to a higher volume of bonds held in the ICSD business, which also benefitted from the strength of the US dollar versus the euro. Net revenue from custody services rose accordingly by 2 per cent in the reporting year. Increased client activity resulted in a 16 per cent higher number of settlement transactions, especially in the ICSD business. Net revenue from settlement services saw a corresponding increase of 8 per cent in the 2019 financial year.

Net interest income from Clearstream's banking business rose 21 per cent to €188.2 million in full year 2019 (2018: €155.5 million). The higher net interest income on cash deposits resulted from catch-up effects from interest rate hikes in the US in 2018, which had outweighed the effect of the three interest rate cuts by the US Federal Reserve in the second half of 2019. The rise in net interest income was also a result of higher US dollar-denominated deposits. Customers cash balances overall rose by 20 per cent to €15.7 billion as at 31 December 2019.

Net revenue from third-party services declined by 24 per cent year-on-year. While revenue from regulatory reporting services offered via REGIS-TR continued to grow, this growth was in total overcompensated by the discontinuation of the managed services business.

Other revenue recorded a year-on-year decline as a result of a one-time €9.3 million insurance payment recognised in the prior year. Other services, including connectivity and account maintenance, however, recorded a rise in net revenue.

Overall, the Clearstream segment increased net revenue by 5 per cent in 2019. Operating costs adjusted for exceptional effects advanced by 2 per cent, mainly as a result of higher staff costs due to additional hirings, which have been partially offset by lower variable compensation. Accordingly, adjusted EBITDA improved year-on-year by 10 per cent.

IFS (investment fund services) segment

IFS (investment fund services) segment: key indicators

	2019	2018	Change
FINANCIAL KEY FIGURES	€m	€m	%
Net revenue	183.1	154.3	19
Custody	76.7	65.9	16
Settlement	53.6	49.4	9
Other (incl. connectivity, order routing and reporting fees)	52.8	39.0	35
Operating costs	110.3	108.3	2
Operating costs (adjusted)	95.1	86.8	10
EBITDA	72.8	46.0	58
EBITDA (adjusted)	88.0	67.5	30
PERFORMANCE INDICATORS			%
Assets under custody (average) (€bn)	2,502	2,385	5
Settlement transactions (m)	27.9	24.5	14

In the IFS (investment fund services) segment, Deutsche Börse Group reports the order routing and settlement activity and custody volumes of mutual, exchange-traded, and alternative funds processed by Clearstream. Clients can settle and manage their entire fund portfolio via Clearstream's Vestima® fund processing platform. Net revenue in the IFS segment is largely a function of the value of assets under custody and the number of transactions.

Assets under custody in the IFS segment climbed by 5 per cent in the 2019 financial year, leading to a 16 per cent rise in net revenue from custody services. The number of settlement transactions rose by 14 per cent in the reporting year fuelled by the onboarding of new clients and high levels of activity among existing clients amid increased market share in growing fund market. As a consequence, net revenue from settlement services increased by 9 per cent.

Following the acquisition of Swisscanto Funds Centre Ltd. at the end of 2018, the rollout of related services launched in mid-2019 progressed as scheduled and several new clients were acquired in the reporting year. Among others, the functionalities of the Fund Desk distribution support service were enhanced and fully integrated into the IFS product range. The services encompass distribution contract negotiation, compliance support services for eligibility control and anti-money-laundering, know-your-customer and know-your-distributor rules, exchange fund data from asset managers to fund distributors and vice versa, as well as a distribution commission management service. As a result, the new service will help clients meet regulatory requirements for transparency and standardisation in fund distribution, which have increased under MiFID II. Thanks to the broader product offering, the IFS segment realised revenue synergies from cross-selling. The net revenues related to the Swisscanto acquisition are included in the “other revenue” line item, which rose by 35 per cent in 2019.

During the 2019 financial year, IFS also completed the acquisition of Ausmaq Limited, the specialist managed funds custody business of National Australia Bank Limited, thereby extending its fund service offering to the Australian market. Australia has recorded steady growth in recent years and ranks number one among the Asia-Pacific fund markets and number four globally with regard to assets under management.

Overall, the IFS segment’s net revenue increased by 19 per cent in 2019. Roughly half of the increase (€13.3 million) was attributable to the acquisitions of Swisscanto Funds Centre Ltd. and Ausmaq Limited, while organic growth amounted to 8 per cent. Due to the segment’s highly scalable business model, adjusted EBITDA climbed by 30 per cent.

GSF (collateral management) segment

GSF (collateral management)segment: key indicators

	2019	2018	Change
FINANCIAL KEY FIGURES	€m	€m	%
Net revenue	78.0	83.1	–6
Collateral management	48.9	43.3	13
Securities lending	29.1	39.8	–27
Operating costs	38.4	48.4	–21
Operating costs (adjusted)	36.3	39.5	– 8
EBITDA	38.1	34.2	11
EBITDA (adjusted)	40.2	43.1	–7
PERFORMANCE INDICATORS	€bn	€bn	%
Average outstandings from collateral management	401.8	377.6	6
Average outstandings from securities lending	48.9	53.8	–9

In the GSF (collateral management) segment, Deutsche Börse Group reports on business development at Clearstream’s collateral management and securities lending services. Collateral management services (formerly named Repo) encompass Tri-Party repo, GC Pooling® and collateral administration services.

Average outstandings in the collateral management business recorded growth of 6 per cent in the 2019 financial year. This was mainly the result of new customer wins and growing volumes in initial-margin segregation products under the European Market Infrastructure Regulation (EMIR). Net revenue from collateral management services increased accordingly by 13 per cent.

The GSF segment succeeded in significantly broadening its customer base in 2019, leading to a steady recovery in securities lending volumes over the course of the year. However, this could not fully offset the challenging market conditions in the business, with average outstanding volumes down 9 per cent compared to the previous year. Negative interest rates and ample liquidity provided by the ECB put added pressure on fees, resulting in a decline of 27 per cent in net revenue from securities lending in 2019.

The GSF segment’s net revenue overall fell by 6 per cent in the 2019 financial year. As a result, adjusted EBITDA declined by 7 per cent.

Qontigo (index and analytics business) segment

Qontigo (index and analytics business) segment: key indicators[1)]

	2019	2018	Change
FINANCIAL KEY FIGURES	€m	€m	%
Net revenue	190.2	157.3	21
ETF licences	38.7	43.8	–12
Exchange licences	31.5	31.3	1
Other licences	94.2	82.2	15
Analytics	25.8	–	–
Operating costs	101.0	53.9	87
Operating costs (adjusted)	69.4	44.5	56
EBITDA	89.2	103.4	–14
EBITDA (adjusted)	120.8	112.8	7
PERFORMANCE INDICATORS	€bn	€bn	%
Assets under management in ETFs on STOXX® indices (average for the period)	71.2	81.9	–13
Assets under management in ETFs on DAX® indices (average for the period)	24.0	27.7	–13
Index derivatives (traded contracts) (m)	879.6	875.4	0

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)

In the Qontigo (index and analytics business) segment, Deutsche Börse Group reports on the development of its subsidiary, Qontigo, which was formed through the merger of STOXX Ltd. and Axioma Inc. in September 2019. In the index business, Qontigo offers issuers an extensive range of indexes, providing issuers with a wealth of opportunities for creating financial instruments for even the most diverse investment strategies. While the ETF licence revenues depend on the volume invested worldwide in exchange-traded index funds (ETFs) on STOXX® and DAX® indices, the exchange licence revenues are determined mainly by the volume traded in index derivatives on STOXX and DAX indices on Eurex. Licence fees from structured products are shown as part of other licence fees. In Analytics, Qontigo offers its clients risk analytics and portfolio-management tools. Revenue in this area depends mainly on order volume. However, a significant portion of this revenue requires the volume of new business to be recognised at the time the revenue is generated (rather than spread over the term of the contract). Actual net revenue may therefore fluctuate from month to month depending on the volume of new business.

In the year under review, European stock indices recorded an outflow of investment funds to other regions – an effect that could not be compensated for by higher index levels compared to the previous year. Average assets under management in ETFs on STOXX and DAX indices each fell by 13 per cent compared to the previous year. ETF licence fees for 2019 declined similarly, by 12 per cent. In line with the almost unchanged trading volume in index derivatives at Eurex, exchange-based licence fees in 2019 were 1 per cent up on the already high figure for the previous year.

In July STOXX Ltd. announced that it had been recognised as administrator according to Article 32 of the EU Benchmarks Regulation. This recognition means that indices managed by STOXX can now be included in the ESMA Benchmark Register. To achieve synergies in Deutsche Börse Group's index business, Deutsche Börse AG has decided to transfer the administration (as defined in the EU Benchmark Regulation) of its indices (DAX, eb.rexx etc.) to STOXX Ltd.

Net revenue from Analytics of €25.9 million, reported for the first time in the 2019 financial year, reflects the new business generated by the merger with Axioma in portfolio management and risk analytics software. Revenue relates to the period since the acquisition was completed (13 September 2019).

Due to the signing of a number of new contracts, including those with buy-side customers, other licence revenues rose by 14 per cent for 2019. Overall, net revenue for the Qontigo segment increased by 21 per cent in the year under review. Adjusted EBITDA for the segment rose by 7 per cent.

Data segment

Data segment: key indicators[1)]

	2019	2018	Change
FINANCIAL KEY FIGURES	€m	€m	%
Net revenue	158.9	170.3	1
Cash and derivatives	112.0	113.6	–1
Regulatory services	19.1	17.8	7
Other (incl. CEF® data services)	27.8	38.9	7
Operating costs	66.3	83.5	–1
Operating costs (adjusted)	51.3	53.0	–3
EBITDA	92.5	86.7	25
EBITDA (adjusted)	107.5	117.2	3
PERFORMANCE INDICATORS	thousand	thousand	%
Subscriptions	334.3	377.8	–12

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)

In the Data segment, Deutsche Börse Group reports on the development of its business concerning licences for real-time trading, market signals and the supply of historical data and analytics. The most important products in this respect are order book data from the cash and derivatives markets, as well as reference data of Deutsche Börse and data from its partner exchanges. The segment generates much of its net revenue on the basis of long-term client relationships; it is relatively independent of trading volumes and capital markets volatility. Revenue from regulatory services is also is shown in this segment.

Net revenue for Data increased year-on-year by 1 per cent. Net revenue for data from the cash and derivatives markets decreased primarily due to higher back billings for the same period last year. Regulatory services saw revenue increase mainly as a result of the positive development in the Group's core business as well as non-recurring effects. The segment's other net revenue (including CEF® data services and external collaborations) increased due to an early termination of a contract.

Overall, adjusted EBITDA for 2019 increased by 3 per cent due to a stronger increase in net revenue compared to adjusted operating costs.

Development of profitability

Deutsche Börse Group's return on shareholders' equity expresses the ratio of net income after taxes to average equity available to the Group during the course of 2019. At 19.3 per cent return on equity was higher than the previous year's ratio (2018: 17.1 per cent). Adjusted for the effects described in Results of operations, the return on equity was 21.3 per cent (2018: 20.8 per cent).

Financial position

Cash flow

Consolidated cash flow statement (condensed)

	2019 €m	2018 €m
Cash flows from operating activities (excluding CCP positions)	1,030.6	1,176.5
Cash flows from operating activities	926.1	1,298.2
Cash flows from investing activities	– 722.9	792.0
Cash flows from financing activities	99.4	– 832.9
Cash and cash equivalents as at 31 December	2,145.5	1,839.0
Cash and other bank balances as at 31 December	888.1	1,322.3

Cash and cash equivalents at Deutsche Börse Group comprise cash and bank balances – to the extent that these do not result from reinvesting current liabilities from cash deposits by market participants – as well as receivables and liabilities from banking business with an original maturity of three months or less. Cash and cash equivalents as at 31 December 2019 amounted to €2,142.1 million (31 December 2018: €1,839.0 million). Other cash and bank balances amounted to €888.1 million as at 31 December 2019 (31 December 2018: €1,322.3 million).

In the 2019 financial year, Deutsche Börse Group generated a positive cash flow of €304.8 million (2018: €1,257.3 million). The informative value of Deutsche Börse Group's cash flow is relevant only to a limited extent since it includes in particular CCP positions which are subject to significant fluctuations on the reporting date, as well as the inflows and outflows resulting from the banking business. Adjusted by these effects, the cash flow in the 2019 financial year can essentially be explained as follows:

Deutsche Börse Group generated €1,030.6 million (2018: €1,176.5 million) in cash flow from operating activities, excluding changes in CCP positions on the reporting date. This figure is determined indirectly, resulting from the net profit for the period amounting to €1,035.4 million (2018: €852.5 million), which is adjusted by non-cash expense and income such as depreciation and deferred tax assets. Additionally, especially higher tax payments in 2019 resulted in a negative contribution to cash flow from operating activities(increase in working capital).

The positive cash flow from operating activities is essentially matched by the purchase of the investments in intangible assets and property amounting to €184.7 million and the distribution of €495.0 million in dividends by Deutsche Börse AG for the 2018 financial year (dividends for the 2017 financial year: €453.3 million). In particular, the acquisition of Axioma Inc. resulted in a total cash outflow in cash flow from investing activities in amount of €648.3 million. At the same time, General Atlantic's participation in the index business of Deutsche Börse Group led to an cash inflow in amount of €666.4 million and to an increase in cash flow from financing activities. Therefore, the acquisition of Axioma Inc. was mostly neutral for cash and cash equivalents.

As in previous year, the Group assumes it will have a strong liquidity base in the 2020 financial year due to its positive cash flows from operating activities, adequate credit lines and flexible management and planning systems.

For further details regarding the cash flow, please refer to the consolidated cash flow statement as well as note 20 to the consolidated financial statements.

Liquidity management
Deutsche Börse Group primarily meets its operating liquidity requirements from internal financing, i.e. by retaining generated funds – with a view towards maintaining sufficient liquidity in order to be able to meet all of the Group's payment obligations when due. An intra-Group cash pool is used for pooling surplus cash as far as regulatory and legal provisions allow. All of the Group’s cash investments are short-term, in order to ensure rapid availability, and are largely collateralised using liquid bonds from prime-rated issuers. Moreover, Deutsche Börse AG has access to external sources of financing, such as bilateral and syndicated credit lines, as well as a commercial paper programme (see note 23 to the consolidated financial statements for details on financial risk management). In recent years, Deutsche Börse AG has leveraged its access to the capital markets to issue corporate bonds in order to meet its structural financing needs.

Debt instruments issued by Deutsche Börse AG (outstanding as at 31 December 2019)

Type	Issue volume	ISIN	Term	Maturity	Coupon (p.a.)	Listing
Fixed-rate bearer bond	€600 m	DE000A1RE1W1	10 years	October 2022	2.375%	Luxembourg /Frankfurt
Fixed-rate bearer bond	€500 m	DE000A1684V3	10 years	October 2025	1.625%	Luxembourg /Frankfurt
Fixed-rate bearer bond	€600 m	DE000A2LQJ75	10 years	March 2028	1.125%	Luxembourg /Frankfurt
Fixed-rate bearer bond (hybrid bond)	€600 m	DE000A161W62	Call date 5.5 years/final maturity in 25.5 years	February 2021/ February 2041	2.75% (until call date)	Luxembourg /Frankfurt

Capital management
The Group’s clients generally expect it to maintain conservative interest coverage and leverage ratios, and hence to achieve a good credit rating.

The Group is committed to achieving the minimum financial risk profile that is consistent with an AA rating in accordance with S&P Global Ratings methodology. Furthermore, the company endeavours to maintain the strong AA credit rating of its subsidiary Clearstream Banking S.A., in order to ensure the long-term success of its Clearstream securities settlement and custody segment. The activities of the Eurex Clearing AG subsidiary also require Deutsche Börse AG to have and maintain a strong credit quality.

To this end, the Group aims to achieve the following relevant key performance indicators:

- Net debt to EBITDA ratio: no more than 1.75
- Free funds from operations (FFO) to net debt: equal to or greater than 50 per cent
- Interest cover ratio: at least 14
- Tangible equity (for Clearstream Banking S.A.): total of at least €1.1 billion

When calculating these key performance indicators, Deutsche Börse Group closely follows the methodology applied by S&P Global Ratings:

- To determine EBITDA, reported EBITDA is adjusted by the result from strategic investments, as well as by unfunded pension obligations. EBITDA for 2019 was €1,679 million.
- In order to determine FFO, interest and tax expenses are deducted from EBITDA, applying the respective imputed adjustments for unfunded pension obligations etc. FFO in 2019 amounted to €1,294 million.
- The Group's net debt is reconciled by first deducting 50 per cent of the hybrid bond, as well as the surplus cash as at the reporting date, from gross debt (i.e. from interest-bearing liabilities). Liabilities from operating leases and unfunded pension obligations are then added. Net debt for 2019 totalled €1,638 million.
- The parameters used to determine interest expenses include interest expenses for financing Deutsche Börse Group, less interest expenses of Group entities which are also financial institutions – including Clearstream Banking S.A., Clearstream Banking AG, and Eurex Clearing AG. Interest expenses incurred which are not related to Group financing are not included in the calculation of interest expenses. Only 50 per cent of the hybrid bond is counted towards interest expenses. Interest expenses totalled €49 million in 2019.

Deutsche Börse AG has declared its intention not to reduce the tangible equity (equity less intangible assets) of Clearstream Banking S.A. below €1,100 million. Clearstream Banking S.A. exceeded this threshold during the year under review, with a level of €1,448 million.

The following table "Relevant parameters" illustrates the calculation methodology and shows the values for 2019.

Relevant key performance indicators according to the adjusted calculation method

		Target figures	2019
Net debt / EBITDA		≤ 1.75	1.0
Free funds from operations (FFO) / net debt	%	≥ 50	79
Interest coverage ratio		≥ 14	34
Tangible equity of Clearstream Banking S.A. (as at the reporting date)	€m	≥ 1,100	1,448

S&P Global Ratings bases the determination of the key performance indicators on the corresponding weighted average of the reported or expected results of the previous, the current and the following reporting period. To ensure the transparency of the key performance indicators, the Group reports them based on the respective current reporting period.

Dividends and share buy-backs

Deutsche Börse Group generally aims to distribute dividends equivalent to between 40 and 60 per cent of adjusted net profit for the period attributable to Deutsche Börse AG shareholders. Within this range, the Group manages the actual payout ratio mainly relative to the business performance and based on continuity considerations. In addition, the company plans to invest the remaining available funds primarily into complementary external development. Should the investment of these funds by the Group not be possible, additional share buy-backs would represent another possibility for distribution.

For the 2019 financial year, Deutsche Börse AG is proposing that the Annual General Meeting resolve to pay a dividend of €2.90 per no-par value share (2018: €2.70). This dividend is equivalent to a distribution ratio of 48 per cent of adjusted net profit for the period, attributable to shareholders of Deutsche Börse AG, adjusted for the non-recurring items described in the Results of operations (2018: 49 per cent, also adjusted). Given 183.4 million no-par shares bearing dividend rights, this would result in a total dividend payment of €532.0 million (2018: €495.0 million). The number of shares bearing dividend rights is produced by deducting 6.6 million treasury shares from the ordinary share capital of 190.0 million shares.

Credit ratings

Credit ratings

	Long-term	Short-term
Deutsche Börse AG		
S&P Global Ratings	AA	A–1+
Clearstream Banking S.A.		
Fitch Ratings	AA	F1+
S&P Global Ratings	AA	A–1+

Deutsche Börse AG regularly has its credit quality reviewed by S&P Global Ratings, while Clearstream Banking S.A. is rated by Fitch Ratings and S&P Global Ratings.

On 29 August 2019, Fitch Ratings affirmed the AA credit rating of Clearstream Banking S.A. with a stable outlook. The rating reflects Clearstream Banking's leading position in the post-trade business and its diligent liquidity management, as well as its impeccable capitalisation.

In 2019, S&P Global Ratings left the AA credit ratings of Deutsche Börse AG and Clearstream Banking S.A. unchanged. Deutsche Börse AG's rating reflects the assumption that the Group will continue its growth strategy and reach at least the lower end of its growth targets. Clearstream Banking S.A.'s rating reflects its strong risk management, minimal debt levels and strong position on the international capital markets, especially through its international custody and transaction business.

As at 31 December 2019, Deutsche Börse AG was one of only two DAX-listed companies awarded an AA rating by S&P Global Ratings. The rating histories of Deutsche Börse AG and Clearstream Banking S.A. are given in the five-year overview.

Net assets

Material changes to net assets are described below; the full consolidated balance sheet is shown in the consolidated financial statements.

Consolidated balance sheet (extract)

	31 Dec 2019 €m	31 Dec 2018 €m
ASSETS		
Non-current assets	11,706.9	15,642.0
thereof intangible assets	5,008.4	4,191.6
thereof goodwill	3,470.5	2,865.6
thereof other intangible assets	1,040.9	952.7
thereof financial assets	6,027.6	11,168.6
thereof financial assets measured at amortised costs	698.7	1,057.1
thereof equity investments measured at FVOCI	66.3	108.8
thereof financial instruments held by central counterparties	5,234.2	9,985.4
Current assets	125,458.4	146,257.1
thereof financial instruments held by central counterparties	78,301.5	94,280.3
thereof restricted bank balances	29,988.7	29,833,6
thereof other cash and bank balances	888.1	1,322.3
EQUITY AND LIABILITIES		
Equity	6,110.6	4,963.4
Liabilities	131,054.7	156,935.7
thereof non-current liabilities	8,610.4	12,854.3
thereof financial instruments held by central counterparties	5,234.2	9,985.4
thereof financial liabilities measured at amortised cost	2,627.2	2,283.2
thereof deferred tax liabilities	226.3	194.5
thereof current liabilities	122,444.3	144,081.4
thereof financial instruments held by central counterparties	77,411.5	94,068.3
thereof financial liabilities measured at amortised cost	14,432.1	19,219.7
thereof cash deposits by market participants	29,755.8	29,559.2

Deutsche Börse Group’s total assets have decreased in comparison with the previous year – this is primarily due to the fall in the financial instruments held by central counterparties on the reporting date.

Intangible assets increased significantly against the background of the acquisitions, which led to an increase in goodwill. Current assets – adjusted for the decline in financial instruments held by central counterparties – are at the same level as in the previous year.

The Group's equity increased significantly year-on-year, due on the one hand to the acquisition of Axioma respectively General Atlantic's stake in Deutsche Börse Group's index business and on the other hand to the retained profit of the previous year.

Overall, Deutsche Börse Group invested €184.7 million in the continued business in intangible assets and property, plant and equipment (capital expenditure or capex) in the reporting period (2018: €160.0 million). The Group’s largest investments were made in the Clearstream and Eurex segments.

Working capital
Working capital comprises current assets less current liabilities, excluding technical closing-date items. Current assets, excluding technical closing-date items, amounted to €898.5 million (2018: €1,098.3 million). As Deutsche Börse Group collects fees for most of its services on a monthly basis, the trade receivables of €447.3 million included in current assets as at 31 December 2019 (31 December 2018: €397.5 million) were relatively low compared with net revenue. The current liabilities of the Group, excluding technical closing-date items, amounted to €1,072.9 million (2018: €1,468.5 million, excluding technical closing-date items). The Group therefore had slightly negative working capital of €170.6 million at the end of the year (2018: €370.2 million).

Technical closing-date items
The "financial instruments of the central counterparties" item relates to the function performed by Eurex Clearing AG and European Commodity Clearing AG: since they act as the central counter parties for Deutsche Börse Group's various markets, their financial instruments are carried in the balance sheet at their fair value. The financial instruments of the central counterparties are described in detail in the risk report and in notes 3, and 13 to the consolidated financial statements.

Market participants linked to the Group's clearing houses partly provide collateral in the form of cash deposits, which are subject to daily adjustments. The cash deposits are generally invested on a secured basis overnight by the central counterparties and reported in the balance sheet under "restricted bank balances". The total value of cash deposits at the reporting dates relevant for the reporting period (31 March, 30 June, 30 September and 31 December) varied between €30 billion and €32 billion (2018: between €28 billion and €30 billion).

Value added: breakdown of company performance
Value added is calculated by subtracting depreciation and amortisation as well as external costs from the company performance. In 2019, the value added by Deutsche Börse Group amounted to €2,194.8 million (2018: €2,028.3 million). The breakdown shows that large portions of the generated value added flow back into the economy: 25 per cent (€548.7 million) benefit shareholders in the form of dividend payments, while 34 per cent (€746.2 million) was attributable to staff costs in the form of salaries and other remuneration components. Taxes accounted for 17 per cent (€373.1 million), while 2 per cent (€43.9 million) was attributable to external creditors. The 22 per cent value added that remained in the company (€482.9 million) is available for investments in growth initiatives, among other things.

Overall assessment of the economic position by the Executive Board

The economic outlook deteriorated further in the 2019 financial year, partly against the backdrop of a continuing trade conflict and the uncertainty surrounding the outcome of an impending Brexit. This was reflected mainly in reticence among market participants, as well as cash outflows from European securities. As a result, volatility was on average lower than in the previous year leading to lower trading in financial derivatives. An environment of persistently low interest rates also had a negative impact on trading volumes in interest rate derivatives. However, averagely higher interest rates on customer deposits held in US dollars resulted in a positive development of the net interest income from banking business. Cyclical effects were unable to drive the Group's growth any further compared to the previous year and broadly offset each other over the period. Consequently growth in the reporting period was primarily the result of structural factors including the development of new products and services, the acquisition of additional market share and the development of new markets. Overall the Group's net revenue from these activities increased by 5 per cent in line with the Executive Board's expectations. Taking into account net revenue from consolidation effects the Group recorded net revenue growth of 6 per cent. After adjusting the previous year's figures to reflect IFRS 16 operating costs rose by 8 per cent. In addition to increased staff costs due to higher numbers of employees another contributing factor was the consolidation of companies acquired during the course of 2019. On an adjusted basis the Group achieved a 10 per cent increase in net profit attributable to Deutsche Börse AG shareholders. which was also in line with the Executive Board's expectations. Based on this, the Executive Board considers Deutsche Börse Group’s financial position to be very solid during the reporting period. The Group generated high operating cash flows as in the previous year. Given the increase in adjusted EBITDA. Deutsche Börse was able to further improve the ratio of net debt to EBITDA at Group level: With a value of 1.0 the target value of 1.75 was clearly undercut.

Deutsche Börse AG has offered its shareholders increasing dividends for years – and the 2019 financial year is no exception. With a proposed dividend of €2.90 (2018: €2.70) this represents a 7 per cent increase on the previous year. As a result of the improvement in earnings the distribution ratio fell slightly from 49 per cent in the previous year to 48 per cent in the year under review (adjusted in each case for non-recurring effects) and was thus in line with the Executive Board's target range of 40 to 60 per cent.

Deutsche Börse Group: five-year overview

		2015	2016	2017	2018	2019
Consolidated income statement						
Net revenue	€m	2,220.3[1]	2,388.7	2,462.3	2,779.7	2,936.0
thereof net interest income from banking business	€m	50.6	84.0	132.6	204.5	246.1
Operating costs (excluding depreciation, amortisation and impairment losses)	€m	– 1,164.2[1]	– 1,186.4	– 1,131.6	– 1,340.2	– 1,264.4
Earnings before interest, tax, depreciation and amortisation (EBITDA)	€m	1,054.6[1]	1,239.2	1,528.5	1,443.7	1,678.3
Depreciation, amortisation and impairment losses	€m	– 119.0	– 131.0	– 159.9	– 210.5	– 226.2
Net profit for the period attributable to Deutsche Börse AG shareholders	€m	613.3[1]	722.1	874.3	824.3	1,003.9
Earnings per share (basic)	€	3.31[1]	3.87	4.68	4.46	5.47
Consolidated cash flow statement						
Cash flows from operating activities	€m	10.1	1,621.4	1,056.2	1,298.2	926,1
Consolidated balance sheet						
Non-current assets	€m	14,386.9	11,938.7	10,883.7	15,642.0	11,706.9
Equity	€m	3,695.1	4,623.2	4,959.4	4,963.4	6,110.6
Financial liabilities measured at amortised cost	€m	2,546.5	2,284.7	1,688.4[2]	2,283.2	2,627.2
Performance indicators						
Dividend per share	€	2.25	2.35	2.45	2.70	2.90[3]
Dividend payout ratio	%	55[4]	54[4]	53[4]	49[4][5]	48[4][5]
Employees (average annual FTEs)		4,460[1]	4,731	5,183	5,397	5,835
Personnel expense ratio (staff costs / net revenue)	%	27	25	26	30	25
Tax rate	%	26	27	27[4]	27[4]	26[4]
Return on shareholders' equity (annual average)[6]	%	20[4]	19[4]	18[4]	21[4]	21[4]
Deutsche Börse shares						
Year-end closing price	€	81.39	77.54	96.80	104.95	140.15
Average market capitalisation	€bn	14.7	14.0	17.2	21.5	24.0
Rating key figures						
Net debt / EBITDA		2.2	1.2	1.1	1.1	1.0
Free Funds from Operations (FFO) / EBITDA	%	35[1]	58	59	69	79
Deutsche Börse AG: S&P Global Ratings	Rating	AA	AA	AA	AA	AA
Clearstream Banking S.A.: S&P Global Ratings	Rating	AA	AA	AA	AA	AA
Fitch	Rating	AA	AA	AA	AA	AA
Market indicators						
Xetra®, Börse Frankfurt and Tradegate						
Trading volume (single-counted)	€bn	1,636	1,377	1,468	1,720	1,500
Eurex®						
Number of contracts	m	1,673[1]	1,728	1,676	1,952	1,947
Clearstream						
Assets under custody (annual average)	€bn	11,460	11,173	11,246	11,303	11,561
Investment fund services (IFS)						
Assets under custody (annual average)	€bn	1,815	1,902	2,219	2,385	2,502

1) Figure for 2015 without consideration of International Securities Exchange (ISE), which represents a discontinued operation due to its disposal as at 30 June 2016
2) Bonds that will mature in the following year are reported under "other current liabilities" (2017: €599.8 million)
3) Proposal to the Annual General Meeting 2020
4) Adjusted for exceptional effects; please refer to the consolidated financial statements for the respective financial year for adjustment details
5) Amount based on the proposal to the Annual General Meeting 2020
6) Net profit for the period attributable to Deutsche Börse AG shareholders / average shareholders' equity for the financial year based on the quarter-end balance of shareholders' equity

Report on post-balance sheet date events

On 21 January 2020 Clearstream the post-trading service provider of Deutsche Börse Group and UBS agreed on a partnership in the fund services sector. The companies have entered into an agreement under which Clearstream will acquire 51 per cent of the Zurich-based fund distribution platform Fondcenter AG from UBS for a purchase price of CHF389 million. UBS will retain a minority stake of 49 per cent. The transaction is expected to be closed in the second half of 2020. Upon completion of the transaction Fondcenter will fully consolidate. The newly formed company will become the competence centre for fund distribution services within Deutsche Börse Group and the combination with the existing Clearstream Fund Desk (formerly Swisscanto Funds Centre) creates a leading provider of fund distribution services with high benefits for customers of UBS and Clearstream.

Combined non-financial statement

This combined non-financial statement for Deutsche Börse Group and the parent company Deutsche Börse AG is integrated into the combined management report; it fulfils the provisions of sections 289b–e and 315b–c of the Handelsgesetzbuch (HGB, German Commercial Code). It is also in accordance with the standards ("Core" option) of the Global Reporting Initiative (GRI). A detailed overview of all GRI indicators (GRI index) is available at www.deutsche-boerse.com > Sustainability > Reporting > GRI. More detailed information that is referenced in the non-financial statement does not form part of the statement itself. Provided no explicit statements are made for the parent company, qualitative information within the meaning of the combined management report applies to Deutsche Börse Group and the parent company Deutsche Börse AG. In some cases, quantitative details concerning the parent entity are disclosed separately.

Deutsche Börse Group uses not only the financial figures outlined in the "Group management" section for Group management, but also non-financial performance indicators – specifically, the availability of its trading systems for the cash and derivatives markets and the share of women in executive positions. For details regarding the targets pursued and the results achieved in the year under review, please refer to the sections entitled "Social matters – systems availability" and "Combined corporate governance statement and corporate governance report – target figures for the proportion of female executives beneath Executive Board level".

A materiality analysis comprising continuous analyses and assessments of relevant internal and external stakeholders' expectations and requirements is a key element of Deutsche Börse Group's sustainability strategy. This process is aimed at identifying the issues required to understand the Group's business performance, operating results, the capital corporation situation and the impact of its activities on non-financial aspects. Thus, the Group is able to identify opportunities and risks in its core business activities at an early stage and define concrete areas of entrepreneurial activity on this basis.

The combined non-financial statement outlines the objectives, actions, due diligence processes applied, the involvement of the Group's management and other stakeholders, as well as the concept outcomes with respect to employee matters (see the "Employees" section), compliance (including combating corruption and bribery), social matters and product matters.

As a service provider with a focus on electronic market infrastructure services, Deutsche Börse Group engages in relatively little environmentally sensitive activity from a corporate ecology perspective; hence, in this combined non-financial statement, no detailed report is provided in this respect. Nonetheless, the Group is committed to protecting the environment and conserving natural resources. Deutsche Börse Group has outlined its environmental policies in its code of business conduct. Indicators for its environmental sustainability performance are available on its website: www.deutsche-boerse.com > Sustainability > Reporting > ESG Indicators. Moreover, environmental protection issues are becoming increasingly relevant for the design of individual products or services; related measures are described in detail in the "Product matters" section. Deutsche Börse Group has also published a climate strategy aligned with the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) in 2019.

The area of human and employee rights was identified as non-material for Deutsche Börse Group during the materiality analysis, and is thus not included in the non-financial statement. Nevertheless, active protection of human and employee rights is a key element of Deutsche Börse Group's corporate responsibility: the Group addresses this at various points along the value creation chain. In addition, complying with human and employee rights is a key pillar of the Group's human resources policy. Specific topics (e.g. diversity) are discussed in the "Employees" section and on the website www.deutsche-boerse.com > Sustainability > Set an example > Employees > Guiding principles. Deutsche Börse Group furthermore reports on sustainability in procurement management on its website at www.deutsche-boerse.com > Sustainability > Set an example > Procurement management and is aware of its responsibility as a global company. It joined the UN Global Compact in 2009.

As an international capital markets organiser, Deutsche Börse Group aims to build and grow market participants' trust in its market structures. As a responsible member of society, it also endeavours to use the expertise it deploys to successfully manage its core business in such a way that enables contribution to resolving social challenges. In this context, Deutsche Börse Group wishes to set a good example. Please refer to the "Fundamental information about the Group" section for a detailed description of Deutsche Börse Group's business model. Deutsche Börse Group acts "with an eye to the future". Its sustainability strategy of the same name defines the Group's understanding of entrepreneurial responsibility and guides its operations. Please see the section entitled "Management approach for a Group-wide commitment to sustainability".

As a member of the UN Global Compact (UNGC) and the Sustainable Stock Exchanges initiative (SSE), Deutsche Börse Group has committed itself to implementing the 17 Sustainable Development Goals (SDGs) of the "2030 Agenda for Sustainable Development" set by the UN. An overview of Deutsche Börse Group's contribution to the corresponding targets can be found in the following "Overview: key sustainability aspects" table.

Overview: key sustainability aspects

Relevant contents of the non-financial statement according to section 289c HGB[1]	Areas for action relevant to Deutsche Börse Group	UN Sustainable Development Goals (SDGs) covered by Deutsche Börse Group
Business model p. 1		
▪ Overview of Deutsche Börse Group ▪ Objectives and strategies ▪ Internal management ▪ Research and development activities	▪ Economic performance ▪ Stakeholder engagement ▪ Brand management	▪ SDG 7 “Affordable and clean energy” ▪ SDG 8 “Decent work and economic growth“ ▪ SDG 9 “Industry, innovation and infrastructure“ ▪ SDG 12 “Responsible consumption and production” ▪ SDG 17 “Partnerships for the goals“
Mandatory aspects		
Employee matters p. 39		
▪ Staff development ▪ Human resources strategy ▪ Promoting diversity and gender equality ▪ Employer attractiveness	▪ Human Capital Development ▪ Human and employee rights	▪ SDG 4 “Quality education” ▪ SDG 5 “Gender equality“ ▪ SDG 8 “Decent work and economic growth“ ▪ SDG 10 “Reduce inequalities“
Social matters p. 46		
▪ Sustainable financial market initiatives ▪ Stable, transparent and fair markets • Systems availability • Market transparency • Stable financial markets	▪ Economic participation and education ▪ Transparent, stable and fair markets	▪ SDG 4 “Quality education“ ▪ SDG 8 “Decent work and economic growth“ ▪ SDG 9 “Industry, innovation and infrastructure“ ▪ SDG 10““Reduce inequalities“ ▪ SDG 12 “Responsible consumption and production” ▪ SDG 16 “Peace, justice and strong institutions“ ▪ SDG 17 “Partnerships for the goals“
Anti-corruption and bribery matters p. 42		
▪ Compliance organisation ▪ Code of business conduct ▪ Compliance rules ▪ Compliance training ▪ Whistleblowing system ▪ Analysis of compliance risks ▪ Due dilligence/customer review ▪ Data protection ▪ Inside information ▪ Internal/external audit	▪ Good governance	▪ SDG 8 “Decent work and economic growth” ▪ SDG 10 “Reduce inequalities“ ▪ SDG 16 “Peace, justice and strong institutions“
Further relevant aspects		
Product matters p. 49		
▪ Customer satisfaction ▪ Sustainable index products ▪ Eurex ESG derivates offering ▪ Energy and energy-related markets	▪ Sustainable product and service portfolio	▪ SDG 7 “Affordable and clean energy” ▪ SDG 8 “Decent work and economic growth“ ▪ SDG 9 “Industry, innovation and infrastructure“ ▪ SDG 12 “Responsible consumption and production“

1) HGB = Handelsgesetzbuch (German Commercial Code)

Employees

This chapter provides an overview of key indicators reflecting staff developments at Deutsche Börse Group; at the same time, it satisfies the requirements for reporting on employee matters, as part of the non-financial statement.

Staff development

As at 31 December 2019, Deutsche Börse Group employed a total of 6,775 staff (31 December 2018: 5,964), drawn from 105 nationalities at 41 locations worldwide. The average number of employees in the reporting period was 6,286 (2018: 5,800). On Group level, this corresponds to an increase of around 8.4 percent compared to the previous year's reporting date.

The fluctuation rate was 8.7 per cent (unadjusted: 10.6 per cent; 31 December 2018: 8.7 and 9.3 per cent). At the end of the year under review, the average length of service for the company was 8.9 years (2018: 9.5 years).

The number of Deutsche Börse AG's employees rose by 54 during the year under review to 1,556.3 as at 31 December 2019 (comprising 563,5 women and 992,8 men; 31 December 2018: 1,502). The average number of employees at Deutsche Börse AG for the 2019 financial year was 1,505 (2018: 1,465). As at 31 December 2019, Deutsche Börse AG employed staff at six locations worldwide.

For more details, please refer to the table entitled "Key data on Deutsche Börse Group's workforce as at 31 December 2019".

Human resources strategy

Employee commitment and highly developed skills are among the cornerstones supporting Deutsche Börse Group's business success. Its corporate culture is characterised by a sense of responsibility, commitment, flexibility and teamwork. Deutsche Börse Group aims to make sure that staff with these qualities continue to join the company in the future and that they stay for the long term, if possible. Deutsche Börse Group's Executive Board is also engaged in employee matters through one of its Board members who is simultaneously Director of Labour Relations as well as through other regular reporting formats. The Group's workforce is diverse in many respects – including nationality, age, gender, religion, or cultural and social origin. The company promotes this diversity and benefits from it, creating an environment conducive to integration from which the corporate culture benefits. This is also in the interests of Deutsche Börse Group's business: its broad range of diverse products and services and the international composition of its client base pose specific requirements regarding the professional and cross-cultural expertise of employees.

Within the scope of its growth strategy, the Group promotes a high-performance culture with a distinct focus on clients' needs and innovation. In order to encourage this culture, Deutsche Börse Group has a remuneration system for executive staff in place that incorporates growth, performance and financial indicators to a greater extent than in previous years.

In July 2019, the Supervisory Board adopted the human resources strategy 2020 initiated by the Executive Board. This strategy is built on a detailed analysis of employee needs and the relevant human resources indicators (e.g. recruiting metrics, key figures on staff development) as well as on the results of an employee survey conducted in February 2019. It rests on the four pillars "attract", "develop", "retain" and "lead". According to these pillars, concepts for employer branding, recruiting, training & development, remuneration and flexible working time models have been drawn up. Quick wins that were realised immediately in 2019 included recruiting via LinkedIn, the Working from Home Policy, the provision of the "Job Bikes" initiative and a promotion committee which convenes on a quarterly basis.

In the course of implementing the strategy, Human Resources was split into an operative business partner team and a strategic concept team. Moreover, expansion of the Shared Service Center is planned over the medium term.

Promoting diversity and gender equality

As a global enterprise, Deutsche Börse Group advocates openness and fairness at the workplace. This is why Deutsche Börse AG signed the "Diversity Charter" to support recognition, appreciation and integration of diversity in the working environment. For Deutsche Börse Group, diversity within the company is the basis for achieving a corporate culture characterised by open dialogue, trust and mutual acceptance.

Deutsche Börse Group does not tolerate any discrimination, whether on the grounds of gender, sexual orientation, race, nationality, ethnic origin, age, religion or disability, and irrespective of whether behaviour among employees is concerned or the placement of orders with third parties. Deutsche Börse Group's Equal Opportunities Officers safeguard the equal treatment of staff members. Moreover, Human Resources has implemented processes designed to ensure equal treatment in the selection of personnel and enable the Group to take prompt action whenever discrimination is suspected. In 2019, no incidents of discrimination were reported at the Frankfurt/Eschborn, Luxembourg, Prague and Cork locations (which are covered by reporting); accordingly, no countermeasures were required.

Employer attractiveness

To remain sustainably successful, the recruiting of top talents is of the essence. Thus the participation at university-based events and social network activities have been increased, and a globally uniform employee referral programme has been established.

Also in place are the "Evolving Leaders" programme, designed to identify and promote future executives from within the Group, as well as the "Show Your Talent" initiative, which is set to create visibility for and support employees' entrepreneurial and innovative potential. At the same time, the programmes are designed to strengthen staff commitment and their performance orientation.

From initial contact to the actual meeting, mentors and mentees can connect on the "Meet your Mentor" platform. Experienced colleagues assume sponsorship for other employees, making their work easier. As mentors, they assist new colleagues in networking beyond their own department, help them to get to know the company and offer a comprehensive, cross-divisional understanding. The "New Role" mentoring programme makes it easier for colleagues to take on a new executive role.

To increase the share of women in executive positions the company ensures that women are identified as candidates. In addition, Deutsche Börse Group offers numerous additional tools to promote female employees, such as targeted succession planning and a mentoring programme that involves internal and external mentors. Meetings and training courses designed specifically for women are held regularly within the scope of a women's network. For details regarding targets for female quotas, please refer to the section entitled "Combined corporate governance statement and corporate governance report – target figures for the proportion of female executives beneath the Executive Board" and the section entitled "Comparison with the forecast for 2019".

Deutsche Börse Group assigns high priority to training its staff and to providing continuing professional development: employees continuously enhance and renew their knowledge by attending exchange-specific training courses. These include, in particular, IT trainings, e.g. for cloud computing, and career path trainings, e.g. for project management and leadership. With regard to personal development, the Group also offers numerous online and live trainings that are tailored to the target group, e.g. for communication, responsibility assumption or teamwork skills. Deutsche Börse also supports its employees and executives in facing their individual challenges by offering a broad range of internal and external professional development measures (see the "Key data on Deutsche Börse Group's workforce as at 31 December 2019" table).

Key data on Deutsche Börse Group's workforce as at 31 December 2019 (part 1)

	Deutsche Börse AG		Deutsche Börse Group			
	All locations		Germany		Luxembourg	
	Male	Female	Male	Female	Male	Female
Employees (HC)	**993**	**564**	**1,772**	**1,088**	**655**	**431**
50 years and older	342	130	520	240	206	102
40–49 years	270	134	489	263	255	161
30–39 years	278	216	576	430	146	115
Under 30 years	103	84	188	155	47	53
Average age	44	40	42	40	44	42
Full-time employees	966	439	1,714	793	628	295
Part-time employees	27	125	58	295	27	136
Length of service						
Under 5 years (%)	45	46	45	45	27	29
5–15 years (%)	23	25	27	27	23	30
Over 15 years (%)	32	29	28	28	50	41
Staff turnover						
Joiners	125	76	255	156	65	39
Leavers	54	39	107	70	36	24
Training days per staff member (FTE's)	4.18	4.33	3,98	4.44	3.91	4.75

Key data on Deutsche Börse Group's workforce as at 31 December 2019 (part 2)

	Deutsche Börse Group						
	Czech Republic		Ireland		Other locations		
	Male	Female	Male	Female	Male	Female	Total (part 1 and 2)
Employees (HC)	**637**	**372**	**219**	**255**	**888**	**459**	**6,775**
50 years and older	21	8	13	8	168	51	1,337
40–49 years	137	55	50	59	250	101	1,819
30–39 years	357	225	66	118	293	199	2,525
Under 30 years	122	84	90	70	177	108	1,094
Average age	36	35	34	35	39	37	39.83
Full-time employees	633	350	218	232	873	423	6158
Part-time employees	4	22	1	23	15	36	617
Length of service							
Under 5 years (%)	65	60	64	42	66	62	49
5–15 years (%)	35	40	29	47	29	36	30
Over 15 years (%)	0	0	7	11	5	4	21
Staff turnover							
Joiners	144	75	73	55	156	88	1,106
Leavers	65	29	31	31	101	52	546
Training days per staff member (FTE's)	2.67	3.03	3.07	2.02	2.23	2.81	3.52

Compliance – including combat against corruption and bribery

Responsible entrepreneurial action implies adherence to laws and regulations; it is also based on the principle of integrity and ethically irreproachable conduct at all times. Deutsche Börse Group has implemented a compliance management system based on regulatory requirements, with the objectives of preventing misconduct and avoiding liability and reputational risks for the Group, its legal representatives, executives and staff. Beyond business-related compliance requirements, the focus is on strengthening a uniform compliance culture throughout the Group, especially with a view to enhancing compliance awareness. The compliance management system – under the responsibility of, and promoted by, the Executive Board of Deutsche Börse AG – therefore constitutes an indispensable element of good corporate governance with respect to compliance. Such a system provides the foundation for sustainable risk transparency; specifically, it facilitates mitigating risks in the areas of money laundering/terrorism financing, data protection, corruption, as well as market manipulation and insider trading; it also monitors requirements concerning financial sanctions and embargoes.

The compliance management system applies to Deutsche Börse AG as well as to domestic and international companies in which Deutsche Börse AG holds a majority interest (whether directly or indirectly). Thanks to its Group-wide compliance approach, Deutsche Börse Group safeguards the respective Group entities' adherence with applicable law and regulatory requirements. The compliance functions and the Chief Compliance Officers of the individual Group entities have a unified reporting line to the Group Chief Compliance Officer, who in turn reports directly to the Executive Board of Deutsche Börse AG. Compliance reporting includes all relevant compliance risk areas within the mandate of the compliance function.

Deutsche Börse Group is continually developing its compliance management system in order to deal with rising complexity and increasing regulatory requirements. Measures have been implemented to prevent, identify, and mitigate Compliance risks and where applicable, to ensure accountability for Compliance incidents, – especially with regard to the areas of money laundering/terrorism financing, financial sanctions and embargoes, as well as market manipulation, insider trading and data protection.

For this purpose, Deutsche Börse Group is aligning its system with the recommendations of an internationally recognised standard (ISO 19600 "Compliance Management Systems – Guidelines"). Based on this standard, the Group's compliance functions identify fields of action and measures to ensure compliance management meets the requirements as they continue to change.

As a member of the UN Global Compact, Deutsche Börse AG has committed to observe the related principles, notably the principle to work against corruption in all its forms, which includes extortion and bribery. In line with its code of business conduct, Deutsche Börse Group prohibits its employees from involving themselves in corruption, or from taking part in any actions which may lead to the impression that the Group promises, arranges, provides, receives, or asks for inadmissible benefits. Bribery and facilitation payments are prohibited.

It is Deutsche Börse Group's guiding principle that the actions and decisions of all employees are taken objectively and with integrity. Management plays a particularly important role in this context. Deutsche Börse Group is fully aware of the so-called "tone from the top" for achieving a high level of attention for avoiding compliance risks – both within the Group and amongst market participants. In order to sustainably enshrine this guiding principle, and to prevent Deutsche Börse Group and its staff from legal sanctions and reputational damage, Compliance has implemented a variety of preventative measures in a risk-oriented approach.

Compliance organisation
Compliance has overall responsibility for identifying and managing Group-wide compliance risks. Compliance devises risk-oriented measures in order to contain and manage identified risks; to communicate risks, incidents, and the effectiveness of the measures taken; it ensures continuous improvement of the compliance management system by way of regular adjustments to the relevant internal policies and processes.

Key compliance topics are discussed by Deutsche Börse's Group Compliance Committee, which comprises senior management representatives from the business divisions and the relevant Group-wide control functions.

Code of business conduct
Deutsche Börse Group's code of business conduct, which is communicated to all members of staff, summarises the most important aspects with regard to corporate ethics and compliance as well as appropriate conduct. The Code focuses on principles to guide decisions – not rules or lists of dos and don'ts. Moreover, Compliance provides employees with compliance-relevant information via the corresponding intranet pages, unless specific confidentiality aspects prevent such communication. For details, see the section entitled "Combined corporate governance statement and corporate governance report".

Compliance rules
Compliance has implemented Group-wide policies covering relevant local requirements. These rules are designed to ensure that the internal stakeholder groups acting on behalf of Deutsche Börse Group comply with the behavioural rules set out in such policies, with the objective of countering breaches of compliance throughout the Group in a preventive, investigative and consequential manner. Group-wide

communications via the intranet are geared towards providing employees (including members of the Executive Board and Managing Directors) with the necessary guidance in their daily work, and making sure they commit to such guidance.

Compliance training
Regular compliance training is essential for a culture of compliance throughout Deutsche Börse Group: employees worldwide are being trained with respect to relevant compliance issues – covering, in particular, the areas of money laundering/terrorism financing, data protection, corruption, market manipulation and insider trading. Managers who are exposed to increased compliance risks on account of their activities receive additional training in line with their needs. Participation in training measures covering the compliance topics mentioned above is mandatory for employees, as well as for management.

Whistleblowing system
Deutsche Börse Group has established a whistleblowing system, where employees can relay information about potential or actual breaches of prudential orregulatory rules and ethical standards, by phone or e-mail, whereby the anonymity of whistleblowers is a fundamental guarantee. Through its commitment to compliance awareness, Deutsche Börse Group cultivates an open approach to dealing with misconduct. For this reason, concerns are often passed on directly to the responsible line manager, or to Compliance. During 2019, six reports were submitted via the whistleblowing system, or directly via line managers or control functions (such as Compliance).

Analysis of compliance risks
In line with regulatory requirements, Deutsche Börse Group carries out detailed risk analyses and/or risk assessments, at least on an annual basis – specifically, it analyses the risk of being abused for the purposes of money laundering/financing of terrorism, corruption and securities law infringements. Such risk analyses and assessments comprise the Group's own business activities as well as business relationships, market participants, products and services. Risk-mitigating measures are derived from the compliance risks identified.

Due diligence review of clients, market participants, counterparties, and business partners, plus transaction monitoring
Deutsche Börse Group is constantly improving its processes for the onboarding of new clients and the review of existing clients ("Know Your Customer" processes). Depending on the assessment of client risk in each case, client relationships are subject to corresponding diligence duties concerning their establishment, update, and monitoring. Client relationships are not entered into where the risks involved are too high. Deutsche Börse Group analyses transaction data in order to identify activity which might indicate potential money laundering.

Deutsche Börse Group is exposed to the risk of sanctions being imposed upon business partners; moreover, there is a risk of bribery and corruption. In this connection, the Group examines its business partners, whereby their details are cross-checked against relevant data sources (such as embargo, sanctions, PEP, terrorist and other "black lists"). Appropriate measures are taken in the event of any match against such lists.

Non-financial key performance figures: corruption/data protection

		2019	2018
Corruption			
Punished cases of corruption		0	1
Percentage of business units for which measures have been taken to address corruption risks	%	100	100
Number of employees who were trained in ABC measures (anti-bribery/corruption)[1)]		6,142	1,562
Data protection			
Number of justified customer complaints relating to data protection		0	0

1) The web-based ABC training is mandatory for employees of Deutsche Börse Group. The number of employees who attended anti-bribery/corruption trainings varies with respect to the year under review due to the training frequencies that extend over a period of several years

Data protection/protection of personal data

Deutsche Börse Group has exposure to a plethora of data during the course of its business activities. The Group takes data protection very seriously and has taken measures to ensure compliance with data protection law, in particular the appropriate and transparent processing of personal data. The Executive Board has appointed a Data Protection Officer and established a data protection organisation to ensure, that the data privacy framework and the principles of the EU General Data Protection Regulation, which came into force in 2018, are adhered to. To this end, the data protection organisation informs and advises the individual legal entities with respect to data protection. The data protection organisation also serves as a contact for data protection authorities, and supports the business units in assessing risks related to the issue of data protection risks. It supports a stronger culture of data protection at Deutsche Börse Group by raising awareness and providing training on data protection in the context of the Group's business activities.

In 2019, the data protection organisation has integrated its monitoring framework into the structure of compliance safeguards and controls, as a second line of defence on data protection. The Data Protection Officer informs senior management on an annual basis about its activities to enhance the Data Protection framework.

Inside information

In its capacity as an issuer of securities, Deutsche Börse Group has access to information which, in accordance with legal requirements, may be classified as inside information. To raise awareness amongst the employees affected, further measures were introduced on a Group-wide basis in 2019. These measures are designed to mitigate the risks of market manipulation and insider trading for employees' personal account transactions and are geared towards ensuring that maximum sensitivity is applied to dealing with such information.

Compliance maintains a Group-wide restricted list in which issuers or financial instruments are included if particularly sensitive, compliance-relevant information. Compliance may impose a general prohibition of trading for such issuers or financial instruments or may prohibit certain types of transactions. A confidential watch list is used to summarise compliance-relevant information about other issuers and/or financial instruments. In particular, Compliance uses these lists to monitor personal transactions of employees as well as information barriers.

Internal/external audit
At least once a year, Internal Audit checks whether the measures and concepts of the compliance management system comply with the regulatory requirements, in a risk-based manner. Moreover, regulated entities are subject to statutory external audits.

Social matters

As a market infrastructure provider, Deutsche Börse Group considers ensuring transparency on the capital markets as its direct responsibility. By ensuring such transparency, it fosters stability in these markets, promoting their economic success. The management is involved through its participation on the Group Sustainability Board; its approach on social and sustainability matters is described in detail in the section "Management approach for a Group-wide commitment to sustainability".

Sustainable financial market initiatives
The Green and Sustainable Finance Cluster Germany e. V. is an initiative committed to enhancing the expertise on sustainable finance in the market, putting that expertise to efficient use, and identifying (as well as taking) specific action to make national and international financial markets structures fit for the future. Kristina Jeromin, Head of Group Sustainability, is one of the two Managing Directors co-heading the Cluster. The Cluster has defined four fields of action: sustainable finance – status quo and innovation; data and digitalisation; metrics and standards; dialogue and knowledge development. It coordinates the activities of the participating institutions within these fields of action and brings them together with policymakers, regulators, civil society and academia. Within Germany, the Cluster collaborates closely with relevant political players in Berlin. At a European level, the Cluster is a member of the technical expert group on sustainable finance and thus actively involved in the European Commission's Action Plan on sustainable finance; the Cluster supports the Action Plan's implementation and is involved in the corresponding consultation process leading to future regulation. Since June 2019, Deutsche Börse Group and the Cluster have been members of the Sustainable Finance Committee to advise the German government and foster dialogue between the financial industry, real economy, civil society and academia.

Stable, transparent and fair markets
Systems availability
Deutsche Börse AG operates its trading systems for the cash and derivatives markets as redundant server installations, distributed across two geographically separated, secure data centres. Should a trading system fail, it would be operated from the second data centre. Together with clients, Deutsche Börse successfully simulated this scenario – as well as the impact of local disruptions – within the scope of the FIA Test (the annual disaster recovery exercise conducted by the Futures Industry Association). Other disruptions, such as workstation malfunctions or personnel failures, were also tested. Thanks to manifold tests and the verified roll-out of software, as well as the continuous monitoring of the network, servers and applications, Deutsche Börse Group achieved a 100 per cent availability of its cash market trading system and 99.996 per cent for its derivatives trading system. These levels corresponded to downtimes of around 0 minutes and 12 minutes, respectively, during the entire year.

Market transparency
Section 42 (1) of the Börsengesetz (BörsG, German Exchange Act) authorises exchanges to impose additional admission requirements and further notification duties upon equity issuers, for parts of the regulated market. Frankfurter Wertpapierbörse (FWB®, the Frankfurt Stock Exchange) used this authorisation in its Exchange Rules (section IV, sub-section 2) to create the "Prime Standard" in 2003. The Prime Standard segment is characterised, on the one hand, by special post-admission obligations, which are monitored by the FWB with any breaches sanctioned by the exchange's Sanctions

Committee; on the other hand, admission to the Prime Standard is a mandatory requirement for inclusion into one of Deutsche Börse AG's selection indices.

Over and above statutory requirements under the Wertpapierhandelsgesetz (WpHG, German Securities Trading Act), Prime Standard issuers must submit their financial reports (annual and half-yearly reports), as well as their quarterly statements for the first and third quarter, to FWB, in German and/or English and within set deadlines. Moreover, Prime Standard issuers must submit their calendars of material corporate events to FWB, hold an analysts' conference at least once a year and publish any inside information in English as well as German. All submissions to FWB must be carried out via the Exchange Reporting System (ERS®). This electronic interface allows for efficient sorting and display of data, helping to spot any impending failure to meet a deadline. This allows FWB to support issuers concerning their transparency duties in the best possible manner by sending out e-mail reminders prior to each deadline. All reports and data submitted to FWB are subsequently available on www.boerse-frankfurt.de/en, the exchange's website, under the respective issuer's name. Information is thus accessible to interested investors in a compact, easy-to-find manner, creating a particular level of market transparency within the Prime Standard segment. Submission via ERS allows for monitoring fulfilment of transparency requirements – seamlessly and without delay.

In 2019, ten cases were submitted to the FWB Sanctions Committee for the delayed disclosure of information. Proceedings had been completed with the expiry of the 23 January 2020 deadline: Fines were imposed in an amount totalling €207,075.

Deutsche Börse Group launched a new segment for green bonds – bonds issued to raise capital for projects with climate and environmental benefits – on the Frankfurt Stock Exchange in November 2018. This "shop window" for green investors includes 235 bonds. All bonds in this segment comply with the Green Bond Principles of the International Capital Markets Association, which offer guidelines on key components of issuance: use of proceeds, process for project evaluation and selection, management of proceeds, as well as reporting. The new segment caters to the demand for sustainable financing, which is rising all over the world. Investors who care not only about the economic, but also the ecological return of their investment can find the right strategy at www.boerse-frankfurt.de www.boerse-frankfurt.de > Bonds > Green Bonds. The bonds included in Deutsche Börse's segment are admitted for trading at various European stock exchanges, including the Frankfurt Stock Exchange.

Stable financial markets

The core economic function of an exchange is to preserve economic prosperity and create the right framework conditions for growth. As a global market infrastructure provider, Deutsche Börse Group operates markets that help enterprises of all sizes to raise equity and debt – which in turn enables them to grow, create and protect jobs and contribute to a higher level of value creation.

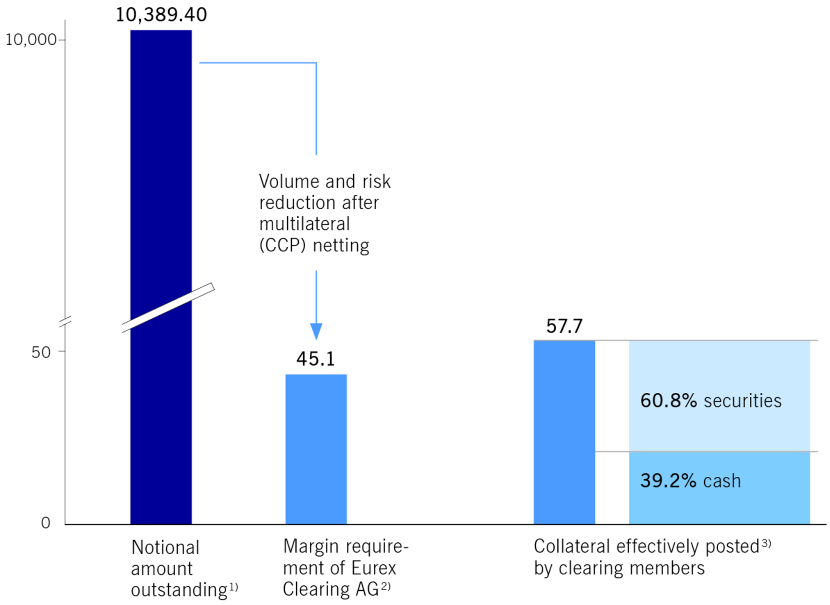
As central counterparty (CCP), Eurex Clearing AG fulfils its responsibility of promoting sustainable global economic growth and stable financial markets. Furthermore, as a clearing house it is an independent risk manager and ensures a neutral valuation of its member's risk positions. It also protects members in the event of a market participant defaulting, thus minimising risks and enhancing both the efficiency of trading and the stability of the financial markets. The bundling of default risk also permits high netting effects, which in turn facilitate sustainable cost savings for the entire market.

The outcome of the UK's Brexit referendum on 23 June 2016 has caused significant uncertainty for the entire European financial services sector. A key issue in this context is the clearing of over-the-counter (OTC) interest rate derivatives. With some €312 trillion (82 per cent), they account for the largest share of outstanding OTC volumes, while being the main driver behind the strong increase registered since 2016 [source: BIS, Semiannual OTC Derivatives Statistics, June 2019; the indication provided by the

Bank for International Settlements of approx. €461 trillion (www.bis.org > Statistics > Derivatives > OTC derivatives statistics) was adjusted by eliminating the dual counting of interdealer volumes (source: www.clarusft.com); €/US$ exchange rate as at 30 June 2019: 1.1380, Deutsche Bundesbank]. The EU and the United Kingdom are currently negotiating the terms for Britain's exit from the EU. A controversial discussion is ongoing concerning future additions to clearing houses outside the EU-27, creating significant uncertainty amongst market participants. Eurex Clearing AG has come up with a solution designed to make the (potentially required) shift of euro clearing into the EU-27 as straightforward as possible for all market participants: the Eurex Clearing Partnership Programme. Through this initiative, Eurex Clearing AG is not only offering the market an attractive alternative for clearing interest rate derivatives outside of London and within the EU-27 but also anticipating potential market turbulence and taking early action to counteract it.

Risk mitigation via netting and collateralisation

€ billion, as at 31 December 2019



[1] **Notional amount outstanding**
As at 31 December 2019, transactions cleared by Eurex Clearing amounted to € 10,389.40 billion notional outstanding.

[2] **Margin requirement**
Risks arising out of open positions are quantified. Eurex Clearing requires its clearing members to post collateral (margin) to cover these risks.

[3] **Collateral**
Clearing members can provide securities and cash as collateral. They may post more collateral than required by Eurex Clearing.

Non-financial key indicators: social matters

		2019	2018
Transparency			
Proportion of companies reporting in accordance with maximum transparency standards[1]	%	92	91
Security			
Availability of cash market trading system[2]	%	100	99.912
Availability of derivatives market trading system[2]	%	99.996	99.963
Average monthly cleared volumes across all products[3]	€ trillion	24.0	23.5

1) Ratio of the market capitalisation of companies listed in the Prime Standard for shares to the market capitalisation of all companies listed on the Frankfurter Wertpapierbörse (FWB®, the Frankfurt Stock Exchange)
2) System availability ranks amongst the most important non-financial performance indicators (as defined in DRS 20 and section 289 (3) in conjunction with section 289 (1) sentence 3 of the HGB) for which a forecast is made
3) Average monthly clearing volume, including exchange-traded and OTC derivatives, as well as securities and repo transactions. Clearing volumes are subject to double counting

Deutsche Börse Group pays wages, salaries and taxes. Its commercial activity therefore contributes to private and public income – this contribution is made transparent in the value-added statement. For details, please refer to the “Value added: breakdown of corporate performance” section.

Product matters

Customer satisfaction

Deutsche Börse Group is executing a Group-wide growth strategy with which it aims to strengthen its agility, ambition, effectiveness and clear customer focus. In improving its organisation, the Group aims to better address changing client needs and gradually tap unutilised potential by means of a Group-wide approach to marketing, sales, innovation and product development.

In 2019, surveys across the EEX, Eurex, 360T and Clearstream began to be standardized; they include common questions and use a standardised “Net Promoter Score” methodology. In this context, businesses ask their clients about their readiness to recommend the service provider with the aim of notifying senior management and staff of the results shortly after the close of the survey. For 2020 there is also the ambition to report the results from as many areas as possible that have carried out a unified survey.

One example of Deutsche Börse Group’s customer focus is Clearstream’s annual client services survey. This survey aims to identify customer needs and prioritise and address enhancement requests to further improve products and services. The results of this survey are taken up by the Clearstream Management Committee, which includes senior management, where concrete actions are taken to address customer needs. The Clearstream senior management is provided with an overview of the items (customers’ needs/complaints) raised in the survey.

Sustainable index products

There is an increasing demand for considering sustainability indicators in the investment process. Qontigo’s index provider STOXX is part of Deutsche Börse Group, and calculates and distributes more than 12,000 indices, a growing number of which are designed after sustainability aspects. STOXX’s offering of sustainability indices is diversified and includes environmental, social and governance- (ESG), climate change- and carbon emissions-related products. Indices are built based on internal research and the evaluation of market demand.

For all indices, the ultimate goal is to provide solutions to investors who consider sustainability a key element of their investment strategy. STOXX® and iSTOXX® indices focus on indicators that can be assessed quantitatively and are compiled by research providers specialised in the field. Within this approach, STOXX aims to select companies that are ranked better than their peers according to selected indicators and tilt the allocation towards those companies.

All data and service providers appointed by STOXX are subject to regular monitoring as required by the regulations of the International Organization of Securities Commissions (IOSCO) and the European Securities and Markets Authority (ESMA). STOXX indices are entirely rule-based. Consequently, there is neither a committee involved nor are customers consulted in the process of reviewing the index composition.

Having launched several index families focused on different aspects of sustainability and by continuing researching applications of sustainable portfolio allocations, STOXX aims to provide its clients with transparent, objective and rules-based solutions. The current index offering ensures that STOXX's products are securely established in the market and that STOXX can offer a timely response to the next developments in sustainability.

STOXX, as an index provider, also has the duty to represent the economic reality of the environment in which financial actors operate. In order to prepare for and help facilitate a shift in investment culture, STOXX develops and maintains a broad range of sustainability indices in response to investors' current as well as anticipated demand. The broad range of solutions may also aim at mitigating business risk should investors decide to reallocate more significant parts of their investments to sustainability-oriented solutions, which may be driven, in part, by investor-specific or external regulations.

As asset owners are steadily stepping up their fiduciary role and are implementing environmental, social and governance (ESG) investment strategies, STOXX is addressing this development by offering two approaches for ESG-compliant versions of STOXX flagship benchmarks:

- STOXX ESG-X indices are ESG-screened versions of flagship STOXX global, regional, country, size and blue-chip benchmarks. They incorporate standard norm- and product-based exclusions that aim to limit market and reputational risks while keeping a low tracking error and a similar risk-return profile to the respective benchmark. STOXX specifically excludes companies that Sustainalytics considers to be non-compliant with the UN Global Compact Principles, are involved in controversial weapons, are tobacco producers (0 per cent revenue threshold) and that either derive revenues from thermal coal extraction or exploration or have power generation capacity that utilises thermal coal (>25 per cent revenue threshold).
- The EURO STOXX 50® ESG index is the ESG-integrated version of the key eurozone benchmark that combines exclusionary screens (as described above) and ESG integration criteria.

The EURO STOXX 50® ESG index and STOXX's suite of ESG-X indices are suitable for underlying mandates, passive funds, ETFs, structured products and listed derivatives with the ambition to increase liquidity and lower the cost of trading.

Overview of STOXX ESG, Climate Change and Carbon-Emission Index Offerings:

- STOXX ESG Benchmark indices
- STOXX ESG-X Benchmark indices
- STOXX Sustainability indices
- STOXX Global ESG Leaders and ESG Specialized Leaders indices
- STOXX Climate indices
- STOXX Low Carbon indices
- ESG Impact indices

In addition to the above-mentioned STOXX indices, the ÖkoDAX® index focuses on German companies active in the renewable energy business and DAXglobal Alternative Energy expands the DAXglobal index family by adding a growth indicator for the alternative energies sector.

iSTOXX ESG offering
Under the umbrella of the iSTOXX brand, STOXX also offers a broad range of customised ESG-related indices that cater to specific client requirements. These indices offer specific strategies within the broader STOXX universe of responsible investing indices that track companies that are pioneering or making the most headway in the transition to a low-carbon economy and a fairer and better world from the perspective of ESG principles.

Visit the STOXX website www.stoxx.com for a complete overview of all STOXX and iSTOXX indices.

Non-financial key indicators: sustainable index products

		31 Dec 2019	31 Dec 2018
ESG criteria			
Assets under management in ETFs based on ESG indices from STOXX[1]	€m	274.3	91.9
Total assets under management in ETFs based on indices from STOXX	€bn	76.3	68.2
Transparency			
Number of sustainable index concepts		224	131
Number of calculated indices		12,554	11,547

1) Based on the ETFs issued in 2016: FlexShares STOXX® Global ESG Impact index and FlexShares STOXX® US ESG Impact index and based on ETFs issued in 2019: EURO iSTOXX ESG-X & Ex Nuclear Power Multi Factor, EURO STOXX ESG-X & Ex Nuclear Power Minimum Variance Unconstrained, EURO STOXX 50 ESG und STOXX Europe 600 ESG-X

Eurex ESG derivatives offering
Eurex took over a pioneering role by introducing an ESG product suite based on European benchmarks in February 2019. The three futures on the highly liquid European STOXX benchmarks covering ESG Exclusions, Low Carbon and Climate Impact support market participants to manage sustainability-driven challenges. In October the first exchange-traded ESG options on a European benchmark was added to the product range. At the same time the offering was further complemented by STOXX Select products with futures and options that capture the performance of European companies with high dividend payments and low volatility which are selected from the STOXX ESG Global Leaders index.

Products available for trading on Eurex:

- EURO STOXX 50® Low Carbon Index Futures
- STOXX® Europe 600 ESG-X Index Futures and Options
- STOXX® Europe Climate Impact Ex Global Compact Controversial Weapons & Tobacco Index Futures
- STOXX® Europe ESG Leaders Select 30 Index Futures and Options

Ten months after their launch in February 2019, STOXX Europe 600 ESG-X Index Futures, which are by far the most popular contracts, have reached over half a million traded contracts with ca. 50 per cent of the flow coming from end clients and asset owners. ESG is one of the major trends and the product interest is in line with Eurex expectations.

Further information is available on www.eurexchange.com -> products -> ESG derivatives

Energy and energy-related markets
Deutsche Börse Group holds a majority shareholding in European Energy Exchange AG (EEX), Leipzig, Germany. The product and service offerings of EEX and its subsidiaries focus on energy and energy-related markets (e.g. power, gas, emission allowances). By providing liquid, secure and transparent markets, EEX group plays an important role in improving the efficient functioning of these markets that are directly linked to questions of climate change. This includes the continuous development of new products and services, providing market solutions to support the long-term transition of Germany's and Europe's energy system towards a higher share of carbon-free, renewable energy sources.

EEX is constantly developing new support within the framework of the German "Energiewende" and wider EU climate and energy policy, which includes the long-term 2030 and 2050 climate and energy policy targets. In addition to power markets, EEX operates a regulated market for emissions allowances. EEX also hosts the central auction platform for the EU Emissions Trading System, organising regular auctions on behalf of 27 EU member states, including 25 countries that form an EU-wide auction platform to be coordinated by the European Commission, Germany and Poland. This system could be expanded to include the heating and transportation sectors.

Furthermore, EEX is developing new hedging instruments to address the effects of increasing power generation from renewables. In the ongoing transition to an energy system with a higher share of renewables, EEX is taking an active role by introducing new products to support this process. An example for the latter has been the extension of maturities in the electricity derivatives market, which allows for electricity production and procurement to be hedged for up to ten years: companies developing renewable energy, and their business partners, can hedge against price volatility and counterparty credit risks over the long term. The extension of maturities is a way of financing the expansion of renewable energy without providing explicit sponsorship. Such long-term maturities and hedging opportunities provided by EEX are already extensively used in Spain.

EEX Group further promotes the integration and marketing of renewables through its role as a provider of registries for so-called guarantees of origin, which are used by electricity distributors to prove the origin of the energy they supply. These guarantees of origin are rising in importance on the market for so-called green gases, too. In February 2019, EEX Group further expanded this business by acquiring Grexel, the leading European provider of guarantees of origin registries. Powernext SE, part of EEX Group, has operated a register for French guarantees of origin since 2013 and has been commissioned by the French government with the organisation of auctions.

Comparison with the forecast for 2019

With regard to the development expected of its non-financial performance indicators for 2019, the Group succeeded in increasing the level of systems availability compared to the previous year: in the cash market, trading system availability was at 100 per cent (2018: 99.912 per cent). The availability of the T7 system for the derivatives market reached 99.996 per cent (2018: 99.963 per cent). Against this backdrop, the company expects to maintain the availability of the different trading systems for the cash and derivatives market at the very high level seen in previous years throughout the forecast period.

In its endeavours to raise the share of women holding executive positions, as early as in 2010, the Executive Board had adopted a voluntary commitment to increase the share of women holding middle and upper management positions to 20 per cent by 2020, and of women holding lower management positions to 30 per cent during the same period. The Group maintains this ambition, and has extended the scope of its voluntary commitment, over and above legal requirements. Firstly, the target figures determined in this context relate to Deutsche Börse Group worldwide. Secondly, the definition of management levels/positions was extended to also include heads of teams, for example. On a global level, as at 31 December 2019, Deutsche Börse Group achieved a quota of 15 per cent for the upper and middle management levels (2018: 14 per cent) and 27 per cent for lower management positions (2018: 29 per cent). For Germany, the quotas were 16 per cent (2018: 14 per cent) and 22 per cent (2018: 26 per cent), respectively.

Risk Report

Deutsche Börse Group includes the following entities which are regulated as credit institutions: Clearstream Banking S.A. and Clearstream Banking AG (hereinafter referred to as "Clearstream", including Clearstream Holding AG), as well as Eurex Clearing AG. Furthermore, Eurex Clearing AG and European Commodity Clearing AG are authorised as central counterparties (CCPs) and are subject to the requirements of the European Market Infrastructure Regulation (EMIR). In addition, other Group companies hold different licences to provide regulated activities in the financial services sector. As such, these entities are subject to comprehensive statutory requirements, inter alia on risk management (for further information on the regulated entities, please refer to note 15 to the consolidated financial statements). Over and above the statutory requirements, including the EU directives (CRD IV and MiFID II) and their implementation into national law, other regulations worth mentioning include primarily EU regulations (CRR and EMIR), the national requirements of the Minimum Requirements for Risk Management (MaRisk) issued by the Federal Financial Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht, BaFin), and circular 12/552 issued by the Financial Supervisory Authority of Luxembourg (Commission de Surveillance du Secteur Financier, CSSF). In this context, significant parts of the risk management are defined in the scope of the so-called second pillar of the Basel III regime for a number of the Group's companies. Moreover, national regulations implementing the EU Banking Recovery and Resolution Directive (BRRD) apply to Clearstream and Eurex Clearing AG regarding the establishment of recovery plans. Deutsche Börse Group follows international standards in its risk management and applies these also without or beyond such statutory requirements.

The highest regulatory standards within the Group are applicable to Eurex Clearing AG and Clearstream, given their regulation as credit institutions. Considering this and their economic importance, this risk report focuses on these subsidiaries in particular.

Risk strategy and risk management

Deutsche Börse Group's risk strategy is aligned with its business model and company strategy. The Group provides the infrastructure for reliable and secure capital markets, assists constructively in their regulation and plays a leading role in all of the areas in which it does business. Deutsche Börse Group's risk strategy is based on three core principles:

1. Risk limitation – protecting the company against liquidation and ensuring its continuing operation
"Capital exhaustion should not occur more than once in 5,000 years and an operating loss must not be generated more than once every hundred years." This means that one goal is to ensure a minimum probability of 99.98 per cent that the total capital will not be lost within the next twelve months. Another objective is to guarantee for a probability of 99.0 per cent or more that Deutsche Börse will at least break even, expressed in terms of its EBITDA. In other words, this principle establishes how much risk the Group must be able to withstand while also determining its risk appetite.

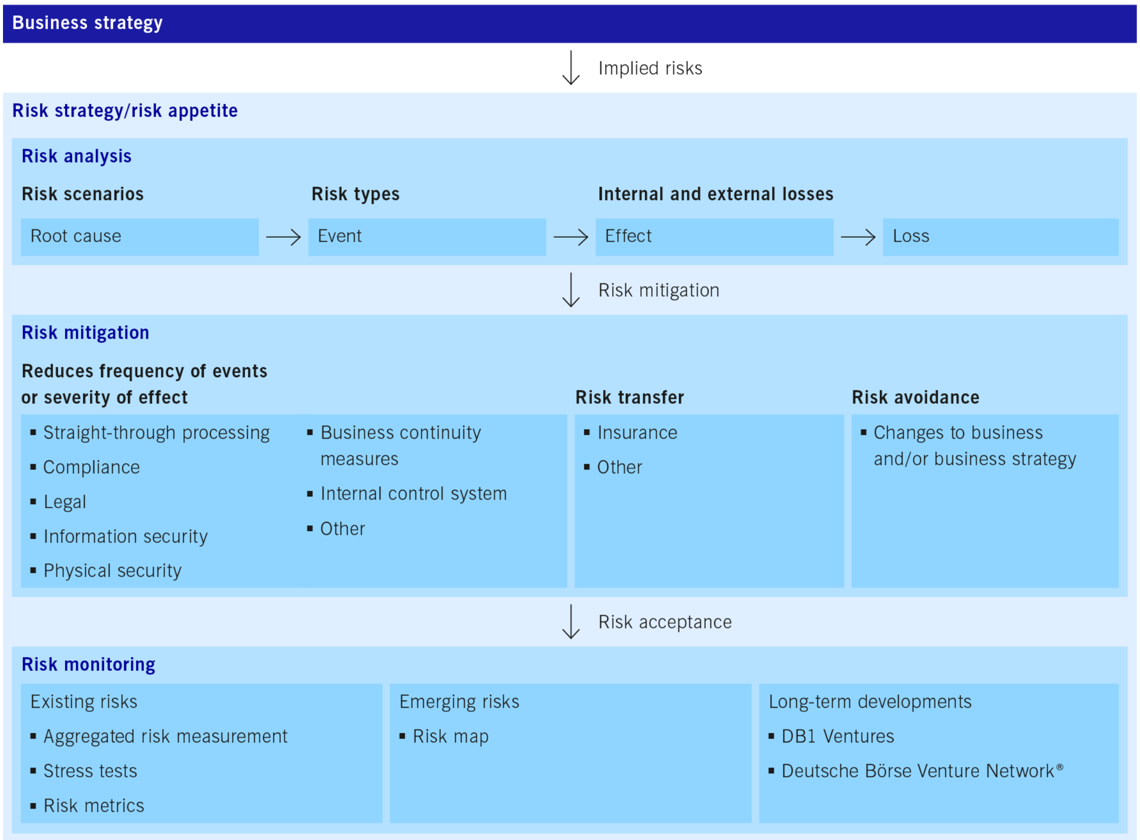
2. Support for growth in the various business segments
"Risk management supports the business units in developing their business". With this principle, the Group promotes its growth strategy. As such, risks are identified, and clearly communicated. This principle includes risk from organic growth, M&A activities and the use of transformational technology. The aim is to make well-founded strategic decisions within the boundaries of the defined risk appetite.

3. Appropriate risk/return ratio

"The return on equity should exceed the cost of equity." Deutsche Börse Group has set itself the goal of ensuring that risk and return should be reasonably balanced, both for specific business areas in general and for individual regions, products and customers.

Internal risk management is based on the Group-wide detection and management of risk, which is focused on its risk appetite, see the chart "Interlocking business strategy and risk strategy". Deutsche Börse AG's Executive Board has overall responsibility, and defines the framework for risk management throughout the Group. Under these Group-wide risk management requirements, each business segment and each regulated company is responsible for managing its own risk.

Interlocking business strategy and risk strategy



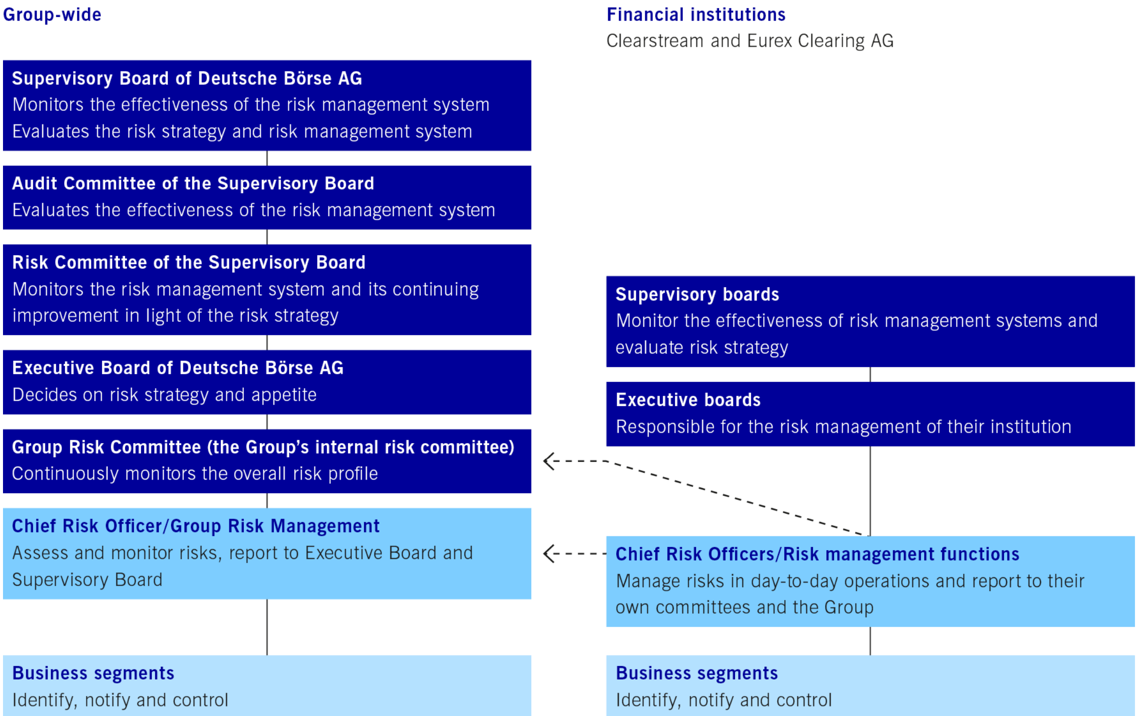
Implementation in the Group's organisational structure and workflow

The risk strategy applies to the entire Deutsche Börse Group. Risk management functions, processes and responsibilities are binding for all Group employees and organisational units. To ensure that all employees are risk-aware, risk management is firmly anchored in the Group's organisational structure and workflows. The Executive Board is responsible for risk management overall, whereas within the individual companies it is the responsibility of the management. The boards and committees given below receive regular information on risk situation.

Supervisory Board of Deutsche Börse AG assesses and monitors the effectiveness of the risk management system and its continuing development. The Supervisory Board has delegated the regular evaluation of the appropriateness and the effectiveness of the risk management system to the Audit Committee. In addition, the Risk Committee examines the risk strategy and risk appetite on an annual basis.

Deutsche Börse AG's Executive Board determines the Group-wide risk strategy and risk appetite and allocates the latter to the company's individual business segments and business units, respectively. It ensures that the Group's risk appetite is and remains compatible with its short- and long-term strategy, business and capital planning, risk-bearing capacity and remuneration systems. The Executive Board of Deutsche Börse AG also determines what parameters are used to assess risks, how risk capital is allocated and what procedures apply. It ensures that the requirements for the risk strategy and risk appetite are met.

Risk management – organisational structure and reporting lines



The Group Risk Committee (GRC) reviews the risk position of the Group at least on a quarterly basis and involves the Executive Board in all decisive questions. The GRC is an internal Group committee, chaired by the Chief Financial Officer.

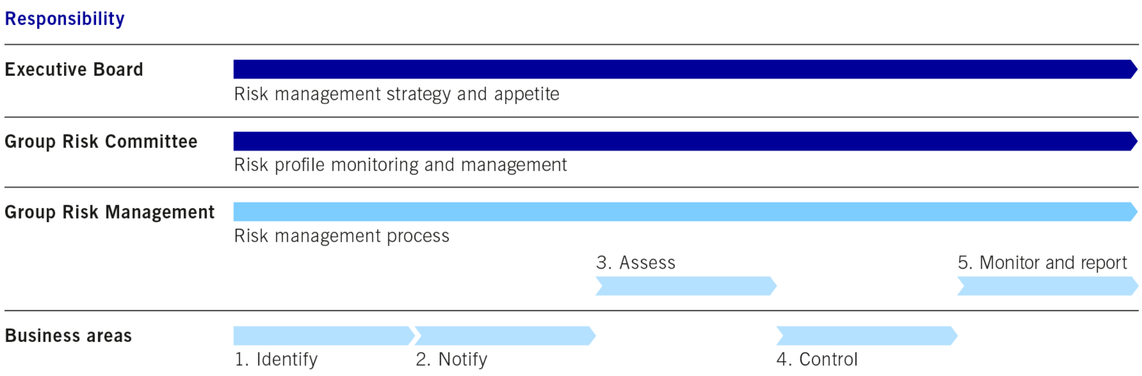
Group Risk Management (GRM), headed by the CRO, prepares the proposals for the corresponding risk strategy, risk appetite, the approaches and methods for monitoring risk, capital allocation and procedures. GRM continuously analyses and evaluates risks and produces quantitative and qualitative reports. These are submitted six times a year to the GRC, once a month to the Executive Board, once a quarter to the Risk Committee of the Supervisory Board and twice a year to the Supervisory Board. Likewise, the CRO reports to the Audit Committee on the appropriateness and effectiveness of the risk management system on an annual basis. This system ensures that the responsible bodies can regularly check whether the defined risk limits are being adhered to consistently. In addition, GRM recommends risk management measures.

The Group's regulated subsidiaries act in the same way, always ensuring that they meet the requirements of the Group. In particular, they adhere to the risk appetite framework allocated to them by Deutsche Börse Group. The relevant supervisory boards and their committees are involved in the process, as are the executive boards and the corresponding risk management functions. Clearstream and Eurex Clearing AG implement customised versions of this risk strategy, using parameters and reporting formats that are compatible with the overarching Group-wide structure. In general, the management of the respective subsidiary bears the responsibility for its risk management and risk appetite; appropriateness and the effectiveness is evaluated by the respective supervisory board.

Centrally coordinated risk management – a five-stage process

Risk management is implemented in a five-stage process. The objective is to identify all potential losses in good time, to record them centrally and to evaluate them in quantitative terms as far as possible; if necessary, management measures must then be recommended and their implementation monitored (see the "The five-stage risk management system" chart): The first stage identifies the risks and the possible causes of losses or operational hitches. In the second stage, the business areas regularly – or immediately, in urgent cases – report to GRM the risks that they have identified and quantified. In the third stage, GRM assesses the risk exposure, while in the fourth stage, the business areas manage the risks by avoiding, mitigating or transferring them, or by actively accepting them. The fifth and final stage involves, for example, monitoring different risk metrics and, where necessary, informing the responsible Executive Board members and committees of significant risks, their assessment and possible emergency measures. In addition to its regular monthly and quarterly reports, GRM compiles ad hoc reports for members of the executive and supervisory boards. The risk management functions at Clearstream and Eurex Clearing AG submit reports to the respective executive boards and supervisory boards. As an independent unit, Internal Audit reviews the risk controlling functions.

The five-stage risk management system



Approaches and methods for risk monitoring

Deutsche Börse Group uses quantitative and qualitative approaches and methods for risk monitoring, with the objective of providing as complete a picture as possible of its risk situation at all times. To this end, the Group continuously reviews internal events with regard to their risk properties, whilst also considering regional as well as global developments. The Group is thus able to recognise and analyse existing risks; at the same time, it is able to swiftly and adequately respond to emerging risks, as well as to changes in the market or in the business environment.

Existing risks

Deutsche Börse Group employs a range of tools to evaluate and monitor operational, financial and business risk on a continuous basis, applying the liquidation principle and the going-concern principle, to quantify and aggregate risks. The value at risk (VaR) model is the main tool used for quantification. The purpose of the VaR model is to determine the amount of capital – given a confidence interval defined ex ante – required to cover potential losses incurred within twelve months. Moreover, so-called stress tests are carried out in order to simulate extreme, yet plausible, events and their impact upon the Group's risk-bearing capacity. Another approach to risk monitoring, which serves as an early warning system for quantified and non-quantifiable in-house risks, is complementary risk metrics. These risk metrics are based on IT and security risks, potential losses, credit, liquidity and business risks.

1. Liquidation principle: what risk can the capital cover?

The required economic capital (REC) is calculated in accordance with the liquidation principle. The first part of Principle 1 of its risk strategy specifies that Deutsche Börse Group should not exhaust its risk-bearing capacity in more than 0.02 per cent of all years. For Clearstream and Eurex Clearing AG, REC calculated in this manner also complies with the requirements of the second pillar of Basel III. Deutsche Börse Group determines its risk-bearing capacity on the basis of its reported equity in accordance with International Financial Reporting Standards (IFRSs). Clearstream and Eurex Clearing AG determine their risk-bearing capacity on the basis of their regulatory capital (for details, see note 15 to the consolidated financial statements).

For management purposes, GRM regularly determines the ratio of the REC to the risk-bearing capacity. This indicator is known as the utilisation of risk-bearing capacity and it answers a key risk management question: how much risk can the Group afford and what risk is it currently exposed to? The ratio of REC to risk-bearing capacity remained within the stipulated maximum risk throughout the reporting period. If this were not the case, the Group would in a worst-case scenario exhaust its entire risk-bearing capacity and would have to be liquidated ("gone concern").

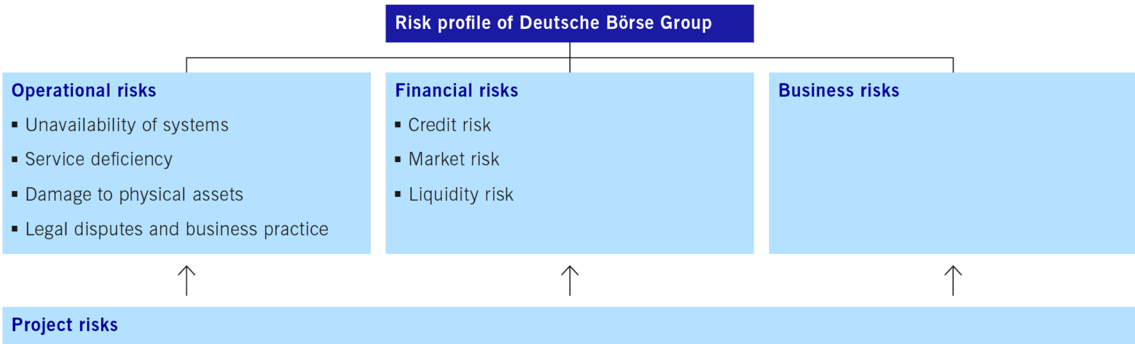
2. Going-concern principle: what risks can be absorbed by earnings?

Deutsche Börse Group employs the going-concern principle that assumes an orderly continuation of the Group in the event of a crisis, and uses earnings at risk ("EaR") as an indicator. This indicator corresponds to the second part of Principle 1 of the Group's risk strategy, i.e. that an operating loss equal to the earnings before interest, tax, depreciation and amortisation (EBITDA) may occur no more than once in a hundred years. In other words, there should be a probability of 99.0 per cent or more that Deutsche Börse should at least break even (profit for the period expressed in terms of EBITDA). Under the going-concern principle, EaR determined in this way is compared with the Group's risk appetite – which is, in turn, measured in terms of projected EBITDA.

3. Regulatory capital requirements

Clearstream and Eurex Clearing AG must calculate their capital requirements for various risk types (see the "Deutsche Börse Group's risk profile" chart) in line with the Pillar I requirements under Basel III. In addition, Eurex Clearing AG must fulfil EMIR capital requirements while Clearstream Banking AG has to comply with CSDR capital requirements as authorisation as CSD was granted by BaFin in January 2020. Clearstream Banking S.A. is currently applying for authorisation according to CSDR. Clearstream and Eurex Clearing AG use a standardised approach for analysing and evaluating credit and market risk.

Deutsche Börse Group's risk profile



The two institutions have adopted different approaches regarding operational risk: Clearstream has used the considerably more complex advanced measurement approach (AMA) for this in all business units since 2008. This means that it meets the regulatory capital requirements for operational risk set out in the EU's Capital Requirements Regulation (CRR). The model is also employed for REC calculations and was fundamentally revised and improved during 2016. According to the method – which has been approved and is regularly audited by BaFin – the required capital is allocated to the regulated entities. In contrast, Eurex Clearing AG employs the basic indicator approach in order to calculate regulatory capital requirements (for details, see note 15 to the consolidated financial statements).

4. Stress tests

Stress tests are being carried out in order to simulate extreme (yet plausible) events for all material types of risk. Using and calculating both hypothetical as well as historical scenarios, this stress test simulates the occurrence of extreme losses, or an accumulation of large losses, within a single year. Similarly, inverse stress tests are also carried out, which analyse which loss scenarios would exceed the risk-bearing capacity.

5. Risk metrics

Risk metrics are used to quantify the exposure to the most important internal risks against set limits. They are complementary to the VaR approach and serve to monitor other factors as well as non-quantifiable risks. Any breach of these limits serves as an early warning signal, which is reported to the Executive Board on a monthly basis. Furthermore, any such breach immediately triggers the requisite risk mitigation processes.

Emerging risks

With regard to risk management, Deutsche Börse Group pursues a sustainable, long-term strategy by also evaluating risks beyond a twelve-month horizon. For this purpose, the Group has developed so-called risk maps tailored specifically for expected or upcoming regulatory requirements and IT and information security risks. In addition, other operational, business and financial risks are also assessed beyond a twelve-month period. Risk maps classify risks by their probability of occurring and by their financial impact, should they materialise. A review process of Environment Social Governance (ESG) aspects is also carried out as part of the Group Risk Committee.

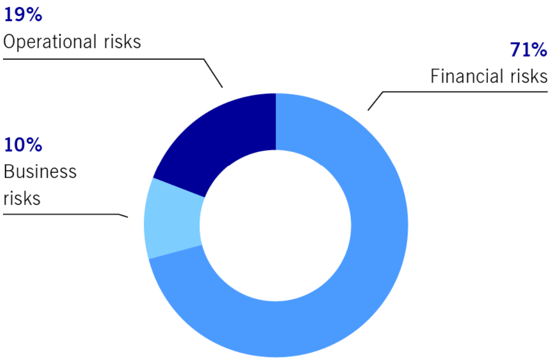
Risk description

The following section describes the types of risk that Deutsche Börse Group generally has to manage and presents the risks it actually faces. It also explains the measures that Deutsche Börse Group uses to attempt to prevent loss events, and to minimise their financial effects.

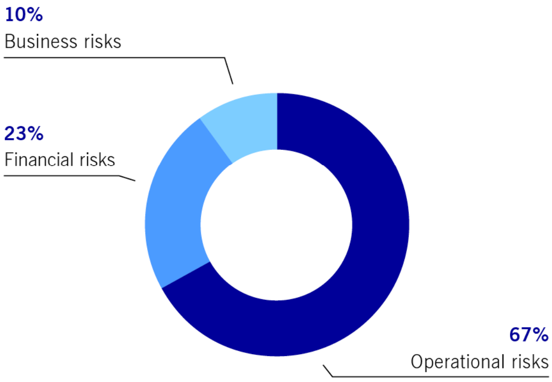
Risk profile

The risk profile of Deutsche Börse Group differs fundamentally from those of other financial services providers. Deutsche Börse Group differentiates between the three standard types of risk: operational risk, financial risk and business risk. Project risk also exists but the Group does not specifically quantify these as their impact is already reflected in the three risk types. The majority of risks are of an operational nature (see the charts below: "Required economic capital for German universal banks by risk type" and "Required economic capital for Deutsche Börse Group by risk type").

Required economic capital for German universal banks by risk type



Required economic capital for Deutsche Börse Group by risk type



Operational risk greater than financial and business risk

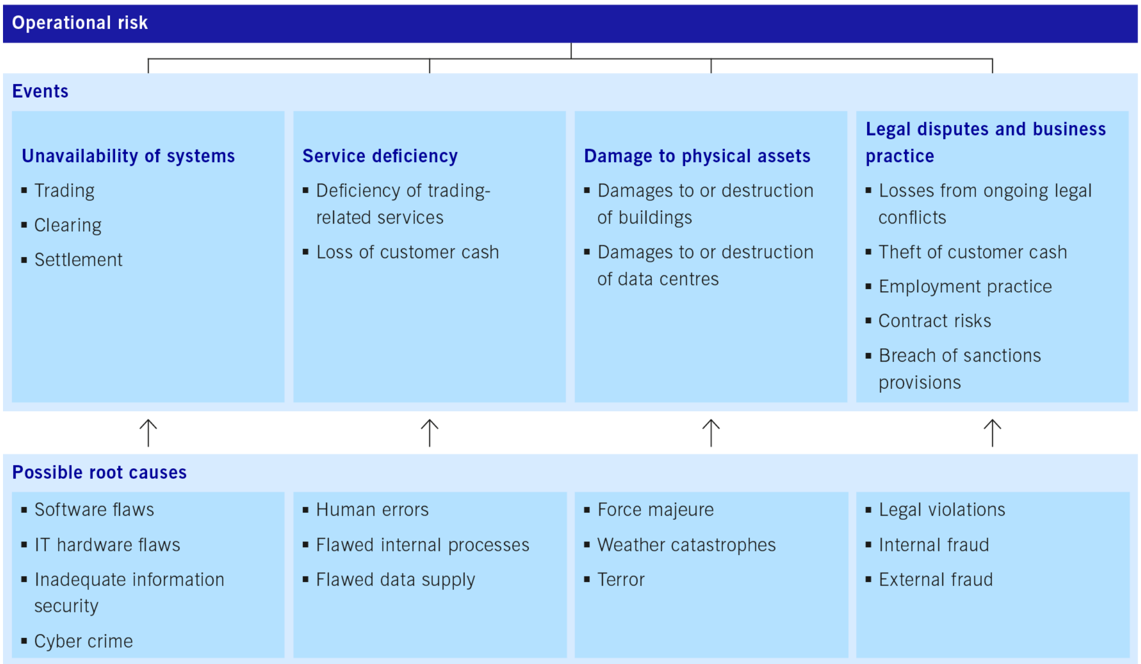
Utilisation of risk-bearing capacity in the liquidation principle and of risk appetite in the going-concern principle are used as internal management indicators throughout Deutsche Börse Group (see the "Approaches and methods for risk monitoring" section for an explanation of these terms). In addition to the financial and operational risk already mentioned, business risk is also identified and assessed. This relates in particular to potential threats to revenue such as price pressure or loss in market share as well as cost risks. Under the liquidation principle, financial risk amounts to only approximately 23 per cent of Deutsche Börse Group's total risk, while business risk represents 10 per cent of the total. This makes the third typical risk type all the more important for Deutsche Börse Group: at 67 per cent, operational risk accounts for two-thirds of the REC. Information on the additional capital requirements of other subsidiaries is provided in note 15 to the consolidated financial statements.

The three risk types applicable to Deutsche Börse Group are described in detail below, in the order of their importance.

Operational risk

For Deutsche Börse Group, operational risks comprise the unavailability of systems, service deficiency, damage to physical assets as well as legal disputes and business practice (see the chart below: "Operational risk at Deutsche Börse Group"). Human resources risks are quantified just like other operational risks. The share of operational risk of the REC was 67 per cent as at 31 December 2019.

Operational risk at Deutsche Börse Group



Unavailability of systems

Operational resources such as the Xetra® and T7® trading systems are essential for the services offered by Deutsche Börse Group. They should never fail in order to ensure that market participants can trade securities or derivatives at any time and without delay. The Group therefore calculates the availability of these systems as an important risk indicator. In line with the Group's risk strategy, the business areas are responsible for monitoring the indicators.

The longer the downtime for one of these systems, the larger the potential loss. An outage could be caused by software or hardware issues, or in unlikely cases, the availability of the systems could be affected by acts of cyber crime or terrorist attack. In the past, only limited failures have occurred both with Xetra and with T7 and its predecessor system. In practice, there has never been a system failure lasting longer than one day. Deutsche Börse Group has taken a number of measures to further minimise the risk of failure lasting an entire day or longer, for example the redundancy of the network infrastructure.

In general, availability risk represents the largest operational risk for Deutsche Börse Group and is therefore subject to regular tests that simulate not only what happens when its own systems fail but also when suppliers fail to deliver.

Service deficiency

Risks can also arise if a service provided to a customer is inadequate and this leads to complaints or legal disputes. One example would be errors in the settlement of securities transactions due to defective products and processes or mistakes in manual entries. A second example are handling errors in the collateral liquidation process in the event of the default of a large clearing customer. Such errors have not occurred to date in the rare case of a failure. The related processes are tested at least annually.

Other sources of error may be attributable to suppliers or to product defects; mistakes that may lead to the loss of client assets or mistakes in accounting processes must also be considered. The Group registers all complaints and formal objections as a key indicator of deficient processing risk.

Damage to physical assets

Natural disasters, accidents, terrorism or sabotage are other operational risks that could, for example, cause the destruction of, or severe damage to, a data centre or office building. Business Continuity Management and Physical Security measures aim at averting significant financial damage (see the chart Business Continuity Management).

Legal disputes and business practice

Losses can also result from ongoing legal proceedings. These can occur if Deutsche Börse Group breaches laws or other requirements, enters into inadequate contractual agreements or fails to monitor and observe case law to a sufficient degree. Legal risk also includes losses due to fraud and labour law issues. This could entail, for example, losses resulting from insufficient anti-money laundering controls or breaches of competition law or of banking secrecy. Such operational risks can also arise if government sanctions are not observed, e.g. in case of conflicting laws of different jurisdictions, or in the event of breaches of other governmental or overarching regulations.

In its 2012 corporate report, Deutsche Börse Group informed about the class action Peterson vs Clearstream Banking S.A., the first Peterson proceeding, targeting turnover of certain customer positions held in Clearstream Banking S.A.'s securities omnibus account with its US depository bank, Citibank NA, and asserting direct claims against Clearstream Banking S.A. for damages of US$250.0 million. The matter was settled between Clearstream Banking S.A. and the plaintiffs and the direct claims against Clearstream Banking S.A. were abandoned.

In July 2013, the US court ordered turnover of the customer positions to the plaintiffs, ruling that these were owned by Bank Markazi, the Iranian central bank. Bank Markazi appealed, and the decision was affirmed on 9 July 2014 by the Second Circuit Court of Appeals and later by the US Supreme Court on 20 April 2016. Once distribution of the funds to the plaintiffs is complete, a related case, Heiser vs Clearstream Banking S.A., also seeking turnover of the same assets, should also be dismissed.

On 30 December 2013, a number of US plaintiffs from the first Peterson case, as well as other plaintiffs, filed a complaint targeting restitution of certain assets that Clearstream Banking S.A. holds as a custodian in Luxembourg. In 2014, the defendants in this action, including Clearstream Banking S.A., moved to dismiss the case. On 19 February 2015, the US court issued a decision granting the defendants' motions and dismissing the lawsuit. The plaintiffs lodged an appeal against this ruling at the competent appeals court (Second Circuit Court of Appeals), which on 21 November 2017 confirmed large portions of the decision of the trial court. The appellate court referred the case back to the court of first instance regarding another aspect, asking the court to assess whether the assets held in Luxembourg are subject to execution in the USA. Clearstream Banking S.A. filed a petition against this ruling with the US Supreme Court on 8 May 2018. The US Supreme Court decided on 13 January 2020 to refer the second Peterson case back to the appeals court for consideration in the light of new US legislation.

On 14 October 2016, a number of US plaintiffs filed a complaint naming Clearstream Banking S.A. and other entities as defendants. The complaint in this proceeding, Havlish vs Clearstream Banking S.A. is based on similar assets and allegations as in the Peterson proceedings. The complaint seeks turnover of certain assets that Clearstream Banking S.A. holds as a custodian in Luxembourg. The complaint also asserts direct claims against Clearstream Banking S.A. and other defendants and purports to seek damages of up to approximately US$6.6 billion plus punitive damages and interest. The proceedings have been suspended due to the pending complaint to the US Supreme Court in the second Peterson case.

On 2 April 2014, Clearstream Banking S.A. was informed that the United States Attorney for the Southern District of New York has opened a grand jury investigation against Clearstream Banking S.A. due to Clearstream Banking S.A.'s conduct with respect to Iran and other countries subject to US sanction laws. Clearstream Banking S.A. is cooperating with the US attorney.

In the context of the ongoing disputes regarding assets of Bank Markazi, Clearstream Banking S.A. was served with a complaint of Bank Markazi on 17 January 2018 naming Banca UBAE S.p.A. and Clearstream Banking S.A. as defendants. The complaint filed before the Luxembourg courts primarily seeks the restitution of assets of Bank Markazi which the complaint alleges are held on accounts of Banca UBAE S.p.A. and Bank Markazi with Clearstream Banking S.A. totalling approximately US$4.9 billion plus interest. Alternatively, Bank Markazi seeks damages to the same amount. The assets sought include assets to the amount of approximately US$1.9 billion that were turned over to US plaintiffs pursuant to a 2013 binding and enforceable US court order in a proceeding to which Bank Markazi was a party. The claim also addresses customer assets of approximately US$2 billion, which include assets that are held at Clearstream Banking S.A. and which are currently subject to US and Luxembourg litigation brought by US plaintiffs, and further addresses assets that were previously transferred out of Clearstream Banking S.A. to Banca UBAE S.p.A.

On 15 June 2018, Banca UBAE S.p.A. filed a complaint against Clearstream Banking S.A. in front of the Luxembourg courts. This complaint is a recourse action related to the complaint filed by Bank Markazi against Clearstream Banking S.A. and Banca UBAE S.p.A and asks that Banca UBAE S.p.A. be indemnified and held harmless by Clearstream Banking S.A. in the event that Banca UBAE S.p.A. loses the legal dispute brought by Bank Markazi and is ordered by the court to pay damages to Bank Markazi.

On 26 December 2018, two US plaintiffs filed a complaint naming Clearstream Banking S.A. and other entities as defendants. The plaintiffs hold claims against Iran and Iranian authorities and persons amounting to approximately US$28.8 million. The complaint in this case (Levin vs. Clearstream Banking S.A.) is based on similar assets and allegations as in the second Peterson case, and the Havlish case. The complaint seeks turnover of certain assets that Clearstream Banking S.A. holds as a custodian in Luxembourg. The complaint also asserts direct claims against Clearstream Banking S.A. and other defendants and purports to seek damages of up to approximately US$28.8 million, plus punitive damages and interest. The proceedings have been suspended due to the pending second Peterson case.

On 4 December 2019, several US plaintiffs from the aforementioned Heiser vs Clearstream Banking S.A. case filed a new complaint naming Clearstream Banking S.A. and other entities as defendants. The plaintiffs hold claims against Iran and Iranian authorities and persons in excess of US$500.0 million, and are seeking turnover of Iranian assets. Also these proceedings will be suspended with a view to the further development of the second Peterson case.

Starting on 16 July 2010, the insolvency administrators of Fairfield Sentry Ltd. and Fairfield Sigma Ltd., two funds domiciled on the British Virgin Islands, filed complaints in the US Bankruptcy Court for the Southern District of New York, asserting claims against more than 300 financial institutions for restitution of amounts paid to investors in the funds for redemption of units prior to December 2008. On 14 January 2011, the funds' insolvency administrators filed a court claim against Clearstream Banking S.A. for the restitution of US$13.5 million in payments made for redemption of fund units, which the funds made to investors via the settlement system of Clearstream Banking S.A. The proceedings, which were suspended for several years, is ongoing.

Legal disputes have arisen regarding a bond issued by MBB Clean Energy AG (MBB), which is held in custody by Clearstream Banking AG. MBB issued the first tranche of the bond in April 2013 and the second tranche of the bond in December 2013. The global certificates for the two tranches were delivered to Clearstream Banking AG by the paying agent of the issuer. The legal disputes relate to the non-payment of the bond and the purported lack of validity of the bond. Clearstream Banking AG’s role in the context of the purported lack of validity of the MBB bond is primarily to safekeep the global certificate as national central securities depository. Insolvency proceedings have meanwhile been opened in respect of the issuer, MBB.

A buyer of an MBB Clean Energy AG (MBB) bond, which is held in custody by Clearstream Banking AG and was listed on the Frankfurt Stock Exchange, filed a lawsuit at a Dutch court concerning claims for damages against Clearstream Banking AG, Deutsche Börse AG and other partners.

In September 2017, Clearstream Banking AG and Clearstream Banking S.A. were made aware that the Public Prosecutor’s Office in Cologne had initiated proceedings for tax evasion against an employee of Clearstream Banking AG for his alleged involvement in the settlement of transactions of market participants over the dividend date (cum/ex transactions). On 22 January 2018, the Public Prosecutor’s Office in Cologne addressed to Clearstream Banking AG a notification of hearing Clearstream Banking AG and Clearstream Banking S.A. as potential secondary participants (Nebenbeteiligte). Starting on 27 August 2019, together with other supporting authorities, the Public Prosecutor’s Office in Cologne conducted searches of the offices of Clearstream Banking AG, Clearstream Banking S.A., as well as other

Deutsche Börse Group companies and sites. In the course of these measures, Deutsche Börse Group entities were made aware that the Public Prosecutor's Office in Cologne has extended the group of accused persons to include further current and former employees of Deutsche Börse Group companies. Due to the early stage of the proceedings, it is not possible to predict timing, scope or consequences of a potential decision. The affected companies are cooperating with the competent authorities. The concerned entities do not expect that they could be successfully held liable.

In November 2018, a customer of a trading participant of the Frankfurt Stock Exchange filed a lawsuit at the District Court (Landgericht) of Frankfurt/Main against Deutsche Börse AG. The plaintiff is claiming damages of approximately €2.6 million from Deutsche Börse AG. The alleged damages are said to have arisen (1) on 7 July 2016, from Deutsche Börse AG's publication of an inaccurate ex-dividend date relating to a financial instrument via the Xetra system and (2) due to the fact that a client of the plaintiff relied on this inaccurate information to conclude transactions.

On 19 December 2018, the German Federal Financial Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht, BaFin) sent Deutsche Börse AG a formal hearing notification in a penalty proceeding, which refers to the allegation of a supposed lack of self-liberation or, alternatively, an allegedly omitted ad hoc announcement. Specifically, in the search for a successor for Carsten Kengeter, Deutsche Börse AG had omitted to qualify as a price-relevant intermediate step the fact that a few days before the appointment of Theodor Weimer in November 2017, two suitable and interested CEO candidates had been identified and a decision about the appointment was planned. Even after consulting with external experts, Deutsche Börse AG believes this allegation is unfounded.

Despite the ongoing proceedings described before, the Executive Board is not aware of any material changes to the Group's risk situation.

Measures to mitigate operational risk

Deutsche Börse Group takes specific measures to reduce its operational risk. Among them are emergency and contingency plans, insurance policies, measures concerning information security and the physical safety of employees and buildings as well compliance rules and procedures.

Emergency and contingency plans

It is essential for Deutsche Börse Group to provide its products and services as reliably as possible. The Group has to maintain its business operations and safeguard against emergencies, failures and crises. If its core processes and resources are not available, this represents not only a substantial risk for the entire Group but also even a potential systemic risk for the financial markets in general. As a result, Deutsche Börse Group has set up a system of emergency and crisis plans covering the entire Group (business continuity management, BCM). This covers all processes designed to ensure continuity of operations in the event of a crisis and significantly reduces unavailability risk. Measures include precautions relating to all important resources (systems, workstations, employees, suppliers), including the redundant design of essential IT systems and the technical infrastructure, as well as emergency measures designed to mitigate the unavailability of employees or workspaces in core functions at all important locations. This includes unavailability due to pandemic based events, like the recent "Coronavirus" outbreak. This situation is being handled in accordance to the Deutsche Börse Group Incident and Crisis Management Process. Precautionary measures are centrally coordinated to ensure continuity of Deutsche Börse Group's critical operations as well as employees' health and safety. Back-up locations are subject to regular tests and remote access is also available. Examples of such precautions are listed in the "Business continuity management" chart.

Business continuity management

Emergency and crisis management process

Systems
- Trading, clearing and settlement systems designed to be available at all times
- Duplication of all data centres to contain failure of an entire location

Workstations
- Emergency arrangements for all essential functions
- Fully equipped emergency workspaces, ready for use at all times
- Remote access to systems for numerous employees

Employees
- Option to move essential operational processes to other sites if staff at one site are not able to work
- Additional precautions to ensure that operations remain active in the event of a pandemic

Suppliers
- Contracts and agreed plans of action for suppliers and service providers to specify emergency procedures
- Careful and continuous check of suppliers' emergency preparations
- Utilisation of multiple suppliers

Preparations for emergencies and crises

The Group has introduced and tested a management process for emergencies and crises that enables it to respond quickly and in a coordinated manner. This is intended to minimise the effects on business processes and on the market and to enable a quick return to regular operations. All business segments have appointed emergency managers to act as central contacts and take responsibility during emergencies and crises. The emergency managers inform the Executive Board or raise the alarm with them in the case of severe incidents. In the event of a crisis, the Executive Board member responsible for the affected business area acts as the crisis manager or delegates this role. The emergency and contingency plans are tested regularly by realistically simulating critical situations. Such tests are generally carried out unannounced. The test results are evaluated based on the following criteria:

- Functionally effective: the measures must be technically successful.
- Executable: the employees must be familiar with the emergency procedure and be able to execute it.
- Timely: emergency measures must ensure that operations restart within the intended time period, namely the recovery time objective (RTO).

Information Security

Attacks on information technology systems and their data – especially due to cyber crime – represent operational risks for Deutsche Börse Group, which is continuously confronted with rising threats in this respect, as are other financial services providers and the entire sector. Unauthorised access, change and loss of information, as well as non-availability of information and services, may all arise as a result of these attacks (such as phishing, DDoS and ransomware attacks). It is worth noting that there was no successful attack on Deutsche Börse Group's core systems in 2019.

In order to maintain the Group's integrity as a transaction services provider, and in order to mitigate and control the risks, Deutsche Börse is continuously implementing measures to increase information security. The aim is to proactively boost the robustness of procedures, applications and technologies against cyber crime in such a way that they are adjusted to the threatening situation and regulatory requirements at an early stage. The foundation for this is formed by a set of core processes together with specific control measures based on the established international information security standards ISO/IEC 27000.

The information security function checks that the information security and information security risk management requirements are adhered to; it also monitors the systemic integration of (and adherence to) security standards, within the scope of product and application development.

The Group operates a situation centre (Computer Emergency Response Team, CERT), which detects and assesses threats from cyber crime at an early stage, and coordinates risk mitigation measures in cooperation with the business units.

Group Information Security operates an Group-wide programme designed to raise staff awareness for the responsible handling of information, and to improve staff conduct in this aspect. All in all, Deutsche Börse Group's security approach includes overall measures in accordance with ISO 27000 covering both the development phase and the operational phase.

Furthermore, Deutsche Börse Group has been a full member of national associations (Cyber Security Sharing and Analytics, CSSA), trade associations (World Federation of Exchanges) and international networks (Financial Services Information Sharing and Analysis Center, FS-ISAC) which contribute significantly towards a forward-looking stance vis-à-vis cyber threats, and the development of strategies to fend off such threats.

Physical security

Deutsche Börse Group places great importance on physical security issues due to the constantly changing global security risks and threats. Corporate Security has developed an integral security concept to protect the company, its employees and values from internal and external attacks and threats – in a proactive as well as reactive manner. Analysts are continuously assessing the security situation at Deutsche Börse Group's locations and are in close contact with authorities (Federal Criminal Police Office – BKA, Federal Office for the Protection of the Constitution – BfV, etc.), security services providers, and security departments of other companies. Multi-level security processes and controls ensure physical safety at the Group's locations. Physical access to buildings and values is monitored permanently; it is based on the access principle of 'least privilege' (need-to-have basis). Penetration tests, inter alia, are carried out on a regular basis to verify the efficiency and effectiveness (as well as the quality) of the security processes at the locations.

In an increasingly competitive global market environment, access to know-how and confidential company information bears the potential of a major financial advantage to outsiders or competitors. Deutsche Börse applies state-of-the-art technology to prevent its knowledge from being obtained illegally, e.g. through wiretapping.

Furthermore, Corporate Security is tasked with providing support to employees while they are travelling or on foreign assignment, i.e. protecting them from risks in the areas of crime, civil unrest, terrorism and natural disasters. In this context, a worldwide travel security programme was established which guarantees a risk assessment before, during and after travelling, supported by a travel-tracking system and a central 24/7 emergency telephone number.

Insurance policies

Operational risks that Deutsche Börse Group cannot or does not wish to bear itself are transferred to insurance companies, if this is possible at a reasonable price. The insurance policies are checked individually and are approved by Deutsche Börse AG's Chief Financial Officer.

Compliance

Compliance at Deutsche Börse is responsible for supporting the individual legal entities in ensuring that regulatory requirements are observed and generally protecting the Group against financial and non-financial risks, such as reputational damage in the markets it serves, in cooperation with supervisory authorities, or the general public. Whilst endowed with appropriate autonomy from the business units, Group Compliance nonetheless fulfils its mandate as an enabler of business, to allow the former to focus on the clients and markets the Group wishes to serve. Compliance has to take the necessary steps to systematically and pre-emptively mitigate compliance risks. This requires the identification of compliance risks, and a risk-based assessment of appropriate measures.

Deutsche Börse Group pursues an enterprise-wide approach to its Compliance function, ensuring that applicable laws and regulatory requirements are followed with respect to individual legal entities. Under applicable law, the Compliance functions of the individual legal entities report to the respective member of the Executive Board responsible for Compliance. Moreover, the Compliance functions and their staff report directly to the Group Chief Compliance Officer via a uniform reporting structure. Wherever possible, Deutsche Börse Group's compliance follows a synergistic and holistic approach by applying Group-wide compliance regulations and standards, with the objective of ensuring that the related concepts are spread throughout the Group.

Deutsche Börse Group's Compliance function has been consistently strengthened over recent years. During the course of 2019, the Group significantly increased its Compliance personnel in major offices around the world, with the objective of coordinating and enhancing the strength of the individual legal entities' Compliance function as well as the alignment between Compliance officers, control functions of individual business segments and other control functions as required by supervisory bodies. This close alignment strengthened the second line of defence. In order to be able to act pre-emptively and to mitigate the compliance risks referred to above, the Group continues to invest into the acquisition and further development of IT tools. This provides a validated data inventory, which enables the Group to consistently and appropriately respond to compliance risks. In 2019, the focus continued on standardising and digitalising compliance processes with an impact on relevant business units. Deutsche Börse Group also improved its due diligence procedures with respect to clients, market participants, counterparties and business partners.

Group Compliance continuously promotes regulartory-compliant and ethically impeccable conduct, as well as integrity amongst all Deutsche Börse Group employees. For instance, staff have been sensitised to (and enhanced emphasis been placed on) compliance-relevant aspects throughout the respective business units and within Deutsche Börse Group's regulatorily required control functions. The code of business conduct encompasses the aforementioned activities and sets a holistic basis for a regulatory environment for Deutsche Börse Group.

Over the last few years, Deutsche Börse Group has devoted itself to the development of market-leading compliance standards. The Group promotes and reflects these standards across its entire product-related value creation chain, particularly from the perspective of a leading global provider of financial markets infrastructure. Deutsche Börse AG decided to align its compliance management system with the globally recognised ISO 19600 standard. This was a crucial next step, designed to exploit Group-wide synergies and to move beyond the scope of regulatory requirements. These efforts will be continued in 2020. A special focus lies on compliance monitoring and controls, on the basis of a Group-wide procedural approach.

Financial risk

Deutsche Börse Group classifies its financial risk into credit, market and liquidity risk (see the "Financial risk at Deutsche Börse Group" chart below). At Group level, these risks account for about 23 per cent of the REC (this information only includes credit and market risk; liquidity risk is not quantified as part of the REC; see note 23 to the consolidated financial statements). They primarily apply to the Group's credit institutions. As a result, the following explanation focuses on Clearstream and Eurex Clearing AG.

The assets and liabilities relating to the financial instruments held by central counterparties balance each other out.

Financial risk at Deutsche Börse Group

Financial risk

Credit risk
- For collateralised and uncollateralised customer credits
- For collateralised and uncollateralised cash investments
- In securities lending
- Participation in default fund
- Outstanding liabilities

Market risk
- For securities
- For pension provisions
- In case of balance-sheet currency mismatches

Liquidity risk
- Customer default
- Payment obligations
- Repayment of customer deposits

Credit risk

Credit risk and counterparty default risks describe the danger that a counterparty might not meet its contractual obligations, or not meet them in full. Measurement criteria include the degree to which the credit line has been utilised, the collateral deposited and concentration risk. Although Clearstream and Eurex Clearing AG often have short-term exposures against counterparties totalling several billion euros overall, these are generally secured by collateral deposited by the market participants. Moreover, the Group regularly evaluates the reliability of its emergency plans at Clearstream and Eurex Clearing AG in the event of client defaults, and the resulting credit risk.

Furthermore, Clearstream Banking S.A. is exposed to credit risk arising from its strategic securities lending transactions (ASLplus). Only selected banks act as borrowers. All borrowing transactions are fully collateralised and only selected bonds with a high credit rating are permitted for use as collateral.

Clearstream grants loans to its clients in order to make the securities settlement more efficient. This type of credit business is, however, fundamentally different from the classic lending business. On the one hand, credit is extended solely for less than a day, and it is generally collateralised and granted to clients with high creditworthiness on the other. Furthermore, the credit lines granted can be revoked at any time.

Under its terms and conditions, Eurex Clearing AG only enters into transactions with its clearing members. Clearing mainly relates to defined securities, rights and derivatives that are traded on specific stock exchanges. Eurex Clearing AG also offers this service for over-the-counter (OTC) products such as interest rate swaps and forward rate agreements. As a central counterparty, it steps in between transactional counterparties. Through offsetting mutual claims and requiring clearing members to post collateral, Eurex Clearing AG mitigates the credit risk exposure.

To date, no default by a client with a secured credit line has resulted in financial losses. Deutsche Börse Group therefore views the probability that one of its customers could become insolvent, and that this could lead to losses for the Group as low.

Credit risk can also arise from cash investments. The Treasury department is responsible here, and has Group-wide authority. Treasury largely makes collateralised investments of funds belonging to Group companies as well as Clearstream and Eurex Clearing AG customers. To date, a counterparty default has not led to a loss for the Group.

Clearstream and Eurex Clearing AG run stress tests to analyse scenarios, such as the default of their largest counterparty. The figures determined in this way are compared with the limits defined as part of the companies' risk-bearing capacity. In addition, the impact of several clearing counterparties defaulting at the same time is calculated for Eurex Clearing AG. A special stress test examines Clearstream Banking S.A.'s credit risk exposure from the settlement procedure with Euroclear. Moreover, inverse stress tests are run to determine the number of counterparties that would have to default for losses to exceed the risk cover amount. Risks identified in the course of stress tests carried out during the 2019 financial year were analysed further, and corresponding risk-reduction measures initiated, e.g. reducing credit risks through diversification.

Deutsche Börse Group generally tracks a variety of risk indicators in addition to its risk measures (REC, EaR and the credit risk stress tests performed). These include the extent to which individual clients utilise their credit lines, and credit concentrations.

Reducing credit risk

Clearstream and Eurex Clearing AG assess the creditworthiness of potential customers or counterparties to an investment before entering into a business relationship with them. The companies do this in the same way: they determine the size of individual customers' credit lines based on requirements and regular creditworthiness checks, which they supplement with ad hoc analyses if necessary. They define haircuts collateral depending on the risk involved, and continually review their appropriateness.

Given the size and volatility of its clients' liabilities, Eurex Clearing AG has developed a leading-edge collateral management system, which is described in detail in the following section.

Safety for the participants and the clearing house

Each clearing member must prove that it has liable capital (or, in the case of funds, assets under management) equal to at least the amounts that Eurex Clearing AG has defined for the different markets. The amount of liable capital (or assets under management) for which evidence must be provided depends on the risk. To mitigate Eurex Clearing AG's risk that clearing members might default before settling open transactions, members are obliged to deposit collateral in the form of cash or securities (margins) on a daily basis and, if required, to meet additional intraday margin calls.

Eurex Clearing AG only permits securities with a high credit quality and liquidity to be used as collateral. Internal valuations and external ratings are used to determine the credit quality. On the basis of these consolidated ratings, only collateral that is classified at least as investment grade is permitted. The limits for bank bonds are raised to at least "A– due to the potential wrong-way risks. The admission criteria are reviewed continually and market risk is covered by haircuts with a confidence level of at least 99.9 per cent. Hence, securities of issuers with lesser credit quality are subject to higher haircuts than those applied to securities with higher credit quality. Eligible collateral that no longer meets the high credit rating requirements at a later point in time (e.g. due to a new consolidated rating) is excluded. Risk inputs are checked monthly and the safety margins are recalculated daily for each security. In addition, a minimum safety margin applies to all securities.

Margins are calculated separately for clearing member accounts and client accounts. Gains and losses resulting from intraday changes to the value of financial instruments are either settled in cash by the counterparties (variation margin) or deposited with Eurex Clearing AG as collateral by the seller due to the change in the equivalent value of the item (premium margin). In the case of bond, repo or equity transactions, the margin is collected from either the buyer or the seller (current liquidating margin), depending on how the transaction price performs compared to the current value of the financial instruments. The purpose of these margins is to offset gains and losses.

In addition, Eurex Clearing AG uses additional collateral to protect itself in the case of default by a clearing member against any risk that the value of the positions in the member's account will deteriorate in the period before the account is settled. This additional collateral is known as the additional margin. The target confidence level here is at least 99.0 per cent (with a minimum two-day holding period) for exchange-traded transactions, or 99.5 per cent (with a five-day holding period) for OTC transactions. Eurex Clearing AG checks daily whether the margins match the requested confidence level: initial margin is currently calculated using the legacy risk-based - margining method, and the new - Eurex Clearing - Prisma method, which is already available for all derivative contracts traded. The new method takes the clearing member's entire portfolio – as well as historical and stress scenarios – into account when calculating margin requirements. The objective is to cover market fluctuations for the entire liquidation period until the account is settled. At present, the risk-based - margining method is still used for cash market products and physical deliveries, as well as for securities lending and repo transactions.

In addition to the margins for current transactions, each clearing member contributes to a default fund, with the contributions based on its individual risk profile. This fund is jointly liable for the financial consequences of a default by a clearing member to the extent that this cannot be covered by the member's individual margin, and its own and Eurex Clearing AG's contributions to the default fund. Eurex Clearing AG uses daily stress tests to check whether its default fund is adequate enough to absorb a default of its two largest clearing members. This involves subjecting all current transactions and their collateral to market price fluctuations at a confidence level of at least 99.9 per cent. In order to be able to determine potential losses in excess of a clearing member's individual margins, the impact on the default fund of a potential default is simulated. Eurex Clearing AG has defined limits which, when exceeded, trigger an immediate adjustment to the size of the default fund if necessary. The following lines of defence are available in case a clearing member is unable to meet its obligations to Eurex Clearing AG due to a delay in performance or a default:

- First, Eurex Clearing AG may net the relevant clearing member’s outstanding positions and transactions and/or close them – in terms of the risk involved – by entering into appropriate back-to-back transactions, or settle them in cash. Clients' segregation models are taken into account accordingly.
- Any potential shortfall that might be incurred in connection with such a closing or cash settlement, as well as the associated costs, would be covered in the first instance by the collateral provided by the clearing member concerned. As at 31 December 2019, collateral amounting to €57,697 million had been provided for the benefit of Eurex Clearing AG (after haircuts).
- After this, the relevant clearing member’s contribution to the default fund would be used to cover the open amount. Contributions ranged from €1 million to €236.7 million as at 31 December 2019.
- Any remaining shortfall would initially be covered by a contribution to the default fund by Eurex Clearing AG. Eurex Clearing AG’s contribution amounted to €200.0 million as at 31 December 2019.
- Only then would the other clearing members’ contributions to the default fund be used proportionately. As at 31 December 2019, aggregate default fund contribution requirements for all clearing members of Eurex Clearing AG amounted to €3,630 million. After the contributions have been used in full, Eurex Clearing AG can request additional contributions from each clearing member, which can be at most twice as high as their original default fund contributions. In parallel to these additional contributions, Eurex Clearing AG provides additional funds of up to €300.0 million, provided via a Letter of Comfort from Deutsche Börse AG (see below). These additional funds will be used together with the additional clearing member contributions, on a pro-rata basis.
- Next, the portion of Eurex Clearing AG's equity which exceeds the minimum regulatory equity would be realised.
- Finally, the remaining minimum regulatory equity of Eurex Clearing AG would be drawn upon.
- Deutsche Börse AG has issued a letter of comfort in favour of Eurex Clearing AG. With this letter of comfort, Deutsche Börse AG commits to provide the funds to Eurex Clearing AG required to fulfil its duties – including the duty to provide additional funds of up to €300.0 million, as mentioned before. The maximum amount to be provided under the Letter of Comfort amounts to €600.0 million, including payments already made. Third parties are not entitled to any rights under the Letter of Comfort.

In the event of default by a clearing member, Eurex Clearing AG carries out a Default Management Process (DMP), with the objective of closing out all positions assumed as a result of the default. Within the scope of the DMP, any costs incurred in connection with such close-out are covered using collateral from Eurex Clearing’s lines of defence. Essentially, within the DMP framework, products which share similar risk characteristics are assigned to liquidation groups that are liquidated using the same process. Within a liquidation group, Eurex Clearing AG will balance its position by transferring defaulted positions to other clearing members, either via an auction or by way of bilateral independent sales. Potential claims against Eurex Clearing AG, arising from the settlement of positions assumed from the defaulted clearing members, are covered by the collateral from the multiple lines of defence. Whenever necessary, these collateral items are disposed on in the market by way of bilateral independent sales, in order to cover the outstanding claims from the settlement of the open positions. The DMP will therefore not only contribute to the security and integrity of capital markets, but will also protect non-defaulted clearing members from any negative effects resulting from the default.

In the past, the DMP of Eurex Clearing AG has been used four times, involving the defaults of Gontard & MetallBank (2002), Lehman Brothers (2008), MF Global (2011), and Maple Bank (2016).

In all of the cases mentioned above, the funds pledged as collateral by the defaulted clearing member were sufficient to cover losses incurred upon closing out positions – in fact, a significant portion of resources was returned to the defaulted clearing member.

Deutsche Börse Group reduces its risk when investing funds belonging to Group companies and client funds by distributing investments across multiple counterparties, all with a high credit quality, by defining investment limits for each counterparty and by investing funds primarily in the short term and in collateralised form if possible. Investment limits are established for each counterparty on the basis of at least annual credit checks and using ad hoc analyses, as necessary. Since extending its licence as an investment and credit institution under the Kreditwesengesetz (German Banking Act), Eurex Clearing AG can also use the permanent facilities at Deutsche Bundesbank and the Swiss National Bank; it is thus in a position to manage the largest part of client funds in a central bank environment.

Investment losses on currencies for which Eurex Clearing AG has no access to the respective central banks will be borne, on a pro-rata basis, by Eurex Clearing AG and by those clearing members active in the currency where losses were incurred. The maximum amount which each clearing member will have to contribute in this manner is the total amount such clearing member has pledged with Eurex Clearing AG as cash collateral in this currency. The maximum amount to be borne by Eurex Clearing AG is €50 million.

Market risk

Market risk include risks of a detrimental development of interest rates, exchange rates or other market prices. Deutsche Börse Group measures these risks using Monte - Carlo simulations based on historical price data, as well as corresponding stress tests.

Clearstream and Eurex Clearing AG invest parts of their equity in securities with the highest credit quality. The majority of these securities have a variable interest rate, interest rate risk is low. The Group avoids open currency positions whenever possible. Furthermore, market risk could result from Deutsche Börse Group’s ring-fenced pension plan assets (Contractual Trust Arrangement (CTA), Clearstream's pension fund in Luxembourg). The Group reduced its risk of extreme losses by deciding to invest a predominant proportion of the CTA on the basis of a value preservation mechanism.

Liquidity risk

Liquidity risk arises if a Deutsche Börse Group company is unable to meet its daily payment obligations or if it can only do so at a higher refinancing cost. Operational liquidity requirements are met primarily internally by retaining funds generated with a view towards maintaining sufficient liquidity in order to be able to meet all of the Group's payment obligations when due. An intra-Group cash pool is used to pool surplus cash from subsidiaries on a Deutsche Börse AG level, as far as regulatory and legal provisions allow. Liquid funds are invested in the short term in order to ensure that they are available. Short-term investments are also largely secured by liquid bonds from first-class issuers. Deutsche Börse AG has access to short-term external sources of financing, such as agreed credit lines with individual banks or consortia, and a commercial paper programme. In recent years, Deutsche Börse AG has leveraged its access to the capital markets to issue corporate bonds in order to meet its structural financing needs.

Since Clearstream’s investment strategy aims to be able to repay customer deposits at all times, liquidity limits are set carefully. In addition, extensive sources of financing are available at all times, such as ongoing access to the liquidity facilities at Deutsche Bundesbank and Banque centrale du Luxembourg.

Due to its role as a central counterparty, Eurex Clearing AG has strict liquidity guidelines and its investment policy is correspondingly conservative. Regular analyses ensure the appropriateness of the liquidity guidelines. In addition, Eurex Clearing AG can use Deutsche Bundesbank's permanent facilities.

Deutsche Börse Group can also be exposed to liquidity risk in case of a customer default. If a clearing member of Eurex Clearing AG defaults, its member position is liquidated. If a Clearstream customer defaults, the – generally collateralised and intraday – credit line granted to increase settlement efficiency would be called, and the collateral provided by the client could then be liquidated. A decline in market liquidity, following a market disruption, would increase Deutsche Börse Group's liquidity risk exposure. By means of stress tests, Clearstream and Eurex Clearing AG calculate for each day of the month – and report on a monthly basis – the liquidity needs that would result if the two largest counterparties were to default, and maintain sufficient liquidity in order to cover the liquidity needs determined. Potential risks that are identified in the course of stress tests are analysed and corresponding risk-reduction measures initiated. During the 2019 reporting year, Eurex Clearing AG and Clearstream continuously held sufficient liquidity to fulfil both regulatory requirements as well as the liquidity needs determined through stress tests.

Business risk

Business risk reflects the fact that the Group depends on macroeconomic and geopolitical developments and is influenced by other external events, such as changes in the competitive environment or regulatory initiatives. It therefore expresses the risks associated with the Group's business environment and sector. It also includes business strategy risk, i.e. the impact of risks on the business strategy and possible adjustments to it. These business risks are represented as variance analyses of planned and actual EBITDA, and are monitored constantly by the divisions. They account for about 10 per cent of the Group's REC. Business risk may result in revenues lagging budget projections or in costs being higher.

Business risk includes the risk that competitors, such as the exchanges Euronext, Singapore Exchange (SGX), ICE Futures Europe and Mercado Español de Futuros Financieros (MEFF), as operators of derivatives markets, might increase their market shares on the European trading markets (both on- and off-exchange).

Additional business risk may arise from regulatory requirements, or from the geopolitical or economic environment – for example, in the event of an intra-Europe crisis affecting monetary union, the impact of negative interest rates or a tariff conflict, having adverse effects on trading activity.

The introduction of a binding carbon dioxide price also represents a potential business risk. Germany's federal government is currently revising its climate policy, with a price tag for carbon dioxide likely to be a key instrument. The integration of the financial sector in this respect – or expansion of the European Union Emissions Trading System (EU ETS) – is possible and would represent an additional cost factor for the Group. The EU index regulation, which is aimed at higher ESG transparency requirements, also represents a potential business risk for the Group. Such a regulation could limit the innovative power of the Group's ESG products, thus reducing the company's long-term success.

The orderly exit of the United Kingdom from the European Union (Brexit) on 31 January 2020 allows for a transition period up to the end of 2020, which may be extended once by up to two years. EU law shall apply in and for the UK during the transition period although the UK will have no co-determination right in the EU institutions. The UK will also remain a part of the EU single market and the EU customs union in this time. The EU and the UK are expected to negotiate a free trade agreement during the transition period. The risk of an unregulated Brexit from January 2021 onwards remains if an agreement cannot be reached within this timeframe. Brexit was subject to continuous analyses with regard to the risk for customers, products and business continuity.

Deutsche Börse Group launched three initiatives aimed at reducing these risks: (1) The Brexit readiness project, which is responsible for coordinating all of Deutsche Börse Group's divisions to retain their access to the markets, (2) the transition team, which will support UK customers through the Brexit process and any adjustments that need to be made, to continue to have access to Deutsche Börse Group and its divisions and (3) the Eurex Clearing partnership programme, which supports an EU-27 alternative for euro clearing. Deutsche Börse Group remains well prepared for Brexit. All divisions have submitted the necessary applications with the British authorities and the customers are well prepared for transferring their activities in full to a unit of the Group located inside EU-27.

The EU-based liquidity pool for Eurex Clearing AG's euro swaps is also growing substantially, so that euro clearing can continue to be offered competitively in Frankfurt, regardless of political developments.

The introduction of a financial transaction tax, which continues to be supported by some European states, might have a negative impact upon Deutsche Börse Group's business activities. Likewise, a sustained period of weak trading activity on the market following a significant downturn on the equity markets (whatever the reasons), for example, also represents a risk to the Group.

Overall assessment of the risk situation by the Executive Board

Deutsche Börse AG's Executive Board is responsible for risk management throughout the Group and regularly reviews the entire Group's risk situation. The Executive Board of Deutsche Börse AG confirms the effectiveness of the risk management system.

Summary

The risk profile of Deutsche Börse Group did not change significantly in the 2019 financial year. Deutsche Börse Group's risks were covered by sufficient risk-bearing capacity at all times, i.e. the allocated risk appetite limits were complied with.

As at 31 December 2019, the Group's REC amounted to €2,696 million, a 5 per cent increase year-on-year (31 December 2018: €2,573 million). REC was covered by sufficient aggregate risk-bearing capacity at all times during the 2019 financial year. EaR amounted to €1,103 million as at 31 December 2019, of which €750 million was attributable to operational risk, €152 million to financial risk, and €201 million to business risk.

Outlook

Deutsche Börse Group continually assesses its risk situation. Based on the calculated REC in stress tests and based on the risk management system, Deutsche Börse AG's Executive Board concludes that the available risk cover amount is sufficient. Furthermore, it cannot identify any risk that would endanger the Group's existence as a going concern.

The Group is determined to further strengthen and expand its Group-wide risk management and internal control system (ICS) in 2020 too, by means of, for example, methodological improvement in the ICS and closer integration of the control functions.

Report on opportunities

Organisation of opportunities management

Deutsche Börse Group's opportunities management aims to identify, evaluate and assess opportunities as early as possible and to take appropriate measures in order to transform opportunities into business success.

Deutsche Börse Group evaluates organic growth opportunities in the individual business areas both on an ongoing basis throughout the year and systematically at the Group level as part of its annual budget planning process. The process begins with a careful analysis of the market environment, which considers both what the customer wants, as well as market developments, competitors and regulatory changes. Ideas for growth initiatives are developed further using uniform, Group-wide templates and subjected to a profitability analysis. On this basis, the Executive Board of Deutsche Börse AG makes the final decision as to which initiatives are to be implemented.

Organic growth opportunities

Deutsche Börse Group has a very broad portfolio of products and services with which it covers all areas of a market infrastructure provider's value creation chain. This makes the Group one of the most broadly based stock exchange organisations in the world. In order to maintain and expand this position the company is pursuing a growth strategy called Roadmap 2020. Among other things Deutsche Börse Group is focusing on organic growth opportunities in order to achieve its strategic goals. The Group makes a basic distinction between structural and cyclical opportunities: structural opportunities arise for example as a result of regulatory changes, new client requirements (such as the growing demand for exchange-traded solutions to over-the-counter (OTC) transactions) or from the trend whereby an increasing portion of assets are allocated in passive investment strategies (e.g. index funds). The company can actively exploit these opportunities. Cyclical opportunities on the other hand cannot be influenced directly by the Group and are driven by macroeconomic changes. In addition Deutsche Börse Group intends to seize long-term opportunities arising as a result of the technological transformation.

Structural growth opportunities
When taking advantage of structural growth potential, Deutsche Börse Group focuses on product- and service-driven initiatives designed to satisfy new client needs as well as regulatory requirements. Moreover, the Group regularly examines whether it can better achieve growth in high-potential asset classes, products or services – organically or through external acquisitions and cooperation agreements. In this connection, the Group has defined the following five areas of business that focus beyond the organic options to external growth as well: commodities, foreign exchange trading, investment funds services, data and index business and fixed-income trading.

The Group expects to see its highest revenue growth in trading and clearing in the coming years, due in part to the clearing of OTC derivatives and further growth in the trading of energy and gas products. Foreign exchange trading via 360T is also expected to provide a contribution to net revenue growth. Post-trading will focus on the further development of investment fund business. The growth focus in pre-trading lies in expanding the index and analytics business. The business potential of the initiatives stated here are described in more detail below.

Clearing of OTC derivatives
The liquidity problems experienced by major market participants during the financial crisis were triggered by the failure to settle bilateral OTC transactions that were mainly entered into on an unsecured basis. In light of this, the leading industrialised nations (G20) agreed to create an effective regulatory environment to make off-exchange derivatives transactions more transparent and more secure. Consequently, the European Union has created the European Market Infrastructure Regulation (EMIR). EMIR involves the obligation to clear standardised OTC derivative transactions using a central counterparty. Preparing for mandatory clearing, Eurex Clearing AG had developed set up a central counterparty to clear OTC derivatives transactions. With the Eurex Partnership Programme, launched in October 2017, Eurex Clearing has created an alternative for clearing interest rate swaps within the EU. The programme has been widely accepted: Hence, since 2018, the notional outstanding volume on Eurex Clearing has increased significantly.

Trading and clearing of power and gas products on EEX
Leipzig-based European Energy Exchange AG (EEX) allows Deutsche Börse Group to offer a broad product range for trading and clearing of spot and derivatives contracts on power and gas as well as emission certificates. EEX has become the central market for energy in Continental Europe and its product range includes the markets Germany, France, the Netherlands, Belgium, Italy and Spain. It has also been active in the US market through its acquisition of Nodal Exchange in 2017. EEX's growth is mainly based on the growing importance of renewable energies for generating energy. Owing to the high degree of fragmentation, as well as the inefficiency of OTC markets, the demand for on-exchange trading and clearing solutions has also increased over recent years. EEX believes it is well positioned in this changing competitive environment to achieve structural growth and gain additional market share.

Growth in foreign-exchange trading (360T)
With the full acquisition of 360T, Deutsche Börse AG successfully explored a new asset class – foreign-exchange trading. 360T® is a leading, globally active currency trading platform, whose broad customer base includes companies, buy-side customers and banks. By combining 360T's knowledge and experience in the foreign exchange market with Deutsche Börse Group's IT expertise, the Group will be able to tap the additional revenue potential. 360T has made progress with various measures for achieving synergies. including the launch of its FX futures and clearing services. Thanks to its leading position, 360T further benefits from a structural trend: even though, at present, the vast majority of daily foreign-exchange trading volumes is still executed off-exchange, demand for transparent, electronic multi-bank trading platforms such as 360T is rising.

Cross-border settlement of investment funds

Clients of Deutsche Börse Group can use Clearstream’s settlement and custody services for their entire fund portfolio – covering traditional investment funds, exchange-traded funds (ETFs) as well as hedge funds. Given that supervisory authorities are also calling for more efficient settlement and custody solutions in order to guarantee maximum security for client assets under custody, the Group expects to acquire additional client portfolios in the future. The Group is also continuously expanding its range of products and services. Clearstream, for example, is extending its range of fund services to include management of distribution agreements, as well as data compilation through acquisitions. Extending the product and service range, Clearstream expects to generate additional net revenue by realising cross-selling synergies.

Expansion of the index and analytics business

Deutsche Börse Group's objective in its index business is to give the already established European index provider STOXX an even more global profile, in order to develop and market other indices worldwide (in addition to its DAX® and STOXX® index families). In addition, Deutsche Börse's index business will continue to take advantage of the structural trend towards passive investment products (ETFs). An increasing number of private clients and asset managers now follow this trend; not only are the costs lower, but many active investment strategies have been returning under-average performance. In order to support these trends more effectively, in 2019 Deutsche Börse AG acquired Axioma Inc., New York, USA, (Axioma), a leading provider of portfolio and risk management solutions. The combination created Qontigo a fully integrated leading information provider for institutional investors, serving the growing market demand for products and analysis in this area.

Cyclical opportunities

In addition to its structural growth opportunities, Deutsche Börse Group has cyclical opportunities, for instance as a result of positive macroeconomic developments. Although the Group cannot influence these cyclical opportunities directly, they could lift Deutsche Börse Group’s net revenue and net profit for the period attributable to Deutsche Börse AG shareholders significantly in the medium term:

- The volumes of interest rate derivatives traded on the Group’s derivatives markets could rise if speculation on trends in long-term yields on German and other European government bonds grows, and if the spread between the various European government bonds continues to narrow.
- In the cash and derivatives market segments - Xetra (securities trading) and Eurex (financial derivatives) - positive economic development, a lasting increase in investor confidence in the capital markets leading to a renewed risk appetite among market participants and a sustained increase in stock market volatility could stimulate trading activity among market participants and boost trading volumes.

Technological opportunities

New developments such as cloud services, in the context of artificial intelligence (AI), big data, robotics, blockchain technology, combined with the potential for innovation offered by fintech companies, are driving change in the financial sector. This new wave of technology might help overcome barriers to market harmonisation, while creating additional efficiency and mitigating risks. This development is expected to last for the next ten years, with digitisation set to accelerate. The challenge for incumbent providers is in finding the right way to open up new business models and innovative technologies.

The Group has optimised its internal processes particularly with regard to cloud services. HR processes, purchasing and settlement of travel expenses, among others, are now processed in the cloud. This has led to a significant streamlining of processes, and also has a positive effect on the Group's costs. The Group is also working on transferring services and processes with clients to the cloud. For instance, the introduction of new trading platforms and updating of existing infrastructure might be tested beforehand by clients, via the cloud. This would lead to significantly more agile processes within the Group, as new processes would be introduced at more frequent intervals, allowing the Group to respond more effectively to clients' requirements. In 2019, Deutsche Börse signed agreements with Microsoft and Google on the use of cloud services, positioning itself at the forefront of cloud use in the European financial services sector.

Blockchain technology constitutes another aspect of technological opportunities. It is considered a disruptive technology at times – but at present, the financial services sector is increasingly exploring its opportunities. Thanks to its decentralised nature, it facilitates direct interaction between participants, thus offering the potential for simplifying complex processes. Established market infrastructure providers such as Deutsche Börse Group, which covers the entire value creation chain from a single source, play an important role when it comes to tapping this potential – meeting existing industry standards at the same time. Besides legal and regulatory requirements, this also involves adhering to security standards, as well as limiting risks and ensuring cost efficiency.

Report on expected developments

The report on expected developments describes Deutsche Börse Group's expected performance for the 2020 financial year. It contains statements and information on events in the future, and is based on the company's expectations and assumptions at the time of publication of this corporate report. In turn, these are subject to known and unknown opportunities, risks and uncertainties. Numerous factors, many of which are outside the company's control, influence the Group's success, its business strategy and its financial results. Should opportunities, risks or uncertainties materialise or should one of the assumptions made turn out to be incorrect, the Group's actual performance could deviate either positively or negatively from the expectations and assumptions contained in the forward-looking statements and information contained in this report on expected developments.

Developments in the operating environment

Macroeconomic environment

With global economic growth slowing further in 2019 as expected, Deutsche Börse Group generally anticipates a slight improvement in the general conditions for global growth in the forecast period. Reasons for this include the prospect of a resolution of the ongoing trade conflicts, mainly between China and the US, the easing of US interest rate policy since mid-2019, as well as the political situation in Europe, especially with regard to the reduced risk of a disorderly withdrawal of the United Kingdom from the European Union. However, at the time of the publication of this combined management report it becomes apparent, that the SARS-CoV-2 („Coronavirus") virus outbreak in China at the end of 2019 will have significant negative implications for the development of the global economy, at least in the first months of 2020.

Future development of results of operations

Given its diversified business model and multiple sources of revenue, Deutsche Börse Group believes it is very well positioned to further improve its results of operations in the medium and long term. This expectation is based on, among other things, the structural growth opportunities that the Group intends to exploit (for details, see the Opportunities report), as well as on additional contributions from mergers and acquisitions.

As in 2019, Deutsche Börse Group expects net revenue from structural growth opportunities to increase by at least 5 per cent in the forecast period. The Group is driving this growth through investment. In doing so, it aims to shift further market share from over-the-counter trading and clearing to the on-exchange segment and to further expand its positions in existing asset classes by introducing new products and functionalities. In contrast, the development of business divisions reliant on cyclical factors continues to depend mainly on the degree of speculation regarding future interest rate development in Europe, and the extent of equity market volatility, potentially resulting in both positive and negative effects on the Group's net revenue growth.

Within the scope of its growth strategy, Deutsche Börse Group pursues clearly defined principles for managing operating costs. Essentially, the Group achieves the necessary flexibility in managing operating costs through two different initiatives designed to enhance operating efficiency. Firstly, the Group has implemented a continuous process to improve operating efficiency. Secondly, the Group has already resolved a series of structural cost reduction measures in 2018, and has largely completed the implementation of the said measures in 2019.

The Group expects adjusted net profit for the period attributable to Deutsche Börse AG shareholders to increase to around €1.20 billion in the forecast period. The Group would then be fully in line with its medium-term growth targets of 10 to 15 per cent average per year for the adjusted net profit for the period from 2017 to 2020.

Forecast for results of operations 2020

	Based on 2019 €m	Forecast for 2020
Net revenue from structural opportunities (excluding non-recurring effects)	2,936.0	>5% growth
Net profit for the period attributable to Deutsche Börse AG shareholders (excluding non-recurring effects)	1,105.5	€bn ~1.20

Trends in non-financial performance indicators

Initiatives to promote the transparency and security of the markets will continue to be a key focus during the forecast period, ensuring that Deutsche Börse Group adds value to society. Against this backdrop, the company expects to maintain the availability of the different trading systems for the cash and derivative market at the very high level seen in previous years throughout the forecast period.

Responsible management that focuses on long-term value creation is of considerable importance for Deutsche Börse Group as a service provider. Given demographic change and the resulting shortage of specialist staff, the company aims to continue to position itself adequately and – among other things – to increase the number of women in management positions.
Deutsche Börse AG's Executive Board has defined target quotas for women on the two management levels beneath the Executive Board, in accordance with section 76 (4) of the AktG, in each case referring to Deutsche Börse AG. By 31 December 2021, the proportion of women holding positions in the first and second management levels beneath the Executive Board is planned to reach 15 per cent and 20 per cent, respectively.

Moreover, as early as in 2010, the Executive Board had adopted a voluntary commitment to increase the share of women holding middle and upper management positions to 20 per cent by 2020, and of women holding lower management positions to 30 per cent during the same period. The Group maintains this ambition, and has extended the scope of its voluntary commitment, over and above legal requirements. Firstly, the target figures determined in this context relate to Deutsche Börse Group (including subsidiaries) worldwide. Secondly, the definition of management levels/positions was extended to also include heads of teams, for example.

Future development of the Group’s financial position

The company expects operating cash flow, which is Deutsche Börse Group’s primary funding instrument, to remain clearly positive in the future. The Group expects that two significant factors will influence changes in liquidity. Firstly, the company plans to invest around €200 million in intangible assets and property, plant and equipment at Group level. These investments will serve primarily to develop new products and services in the Eurex (financial derivatives) and Clearstream (post-trading) segments, and to enhance existing ones. Secondly, the Executive Board and Supervisory Board of Deutsche Börse AG will propose a dividend of €2.90 per share to the Annual General Meeting to be held in May 2020. This would correspond to a cash outflow of about €532 million. Against the background of the growth strategy, the company anticipates that, in future, freely available funds will increasingly also be applied to the Group’s complementary external growth options. Apart from the above, no other material factors were expected to impact the Group’s liquidity at the time the combined management report was prepared. As in previous years, the Group assumes that it will have a sound liquidity base in the forecast period due to its positive cash flow from operating activities, adequate credit lines (for details see note 23 to the consolidated financial statements for details), and flexible management and planning systems.

Deutsche Börse Group generally aims to distribute dividends equivalent to between 40 and 60 per cent of adjusted net profit for the period attributable to Deutsche Börse AG shareholders. Within this range, the Group manages the actual payout ratio mainly relative to the business performance and based on continuity considerations. In addition, the company plans to invest the remaining available funds primarily into organic growth, but also, secondarily, for the Group’s complementary external development. Should the Group be unable to invest these funds, additional payouts, particularly share buy-backs, present another opportunity for the use of funds. To maintain its strong credit ratings at

Group level, the company aims at a ratio of net debt to EBITDA of no more than 1.75, and a ratio of free funds from operations to net debt of at least 50 per cent.

Overall assessment by the Executive Board

The Executive Board of Deutsche Börse AG believes that the Group continues to be very well positioned in terms of international competition, thanks to its comprehensive offering along the securities trading value chain and its innovative strength. Against this backdrop, the Executive Board expects to see a positive trend in the Group' s results of operations over the long term. The purpose of the measures as part of the growth strategy is to further accelerate the Group's growth. In this context, the Group aims to act in a more agile and effective manner, and with increased client focus, to turn Deutsche Börse into the global market infrastructure provider of choice, being top-ranked in all its activities. Looking at the economic and regulatory framework over the forecast period, uncertainty persists concerning capital market participants' behaviour; therefore, it is impossible to come up with a concrete forecast for cyclical growth in net revenue. Nonetheless, Deutsche Börse Group endeavours to further expand its structural growth areas, and to increase their contribution to net revenue again by at least 5 per cent. In terms of net profit for the period attributable to Deutsche Börse AG shareholders, the Executive Board expects growth (excluding non-recurring effects) of around €1.20 billion in the forecast period. Overall, the Executive Board assumes on this basis that cash flow from operating activities will be clearly positive and that, as in previous years, the liquidity base will be sound. The overall assessment by the Executive Board is valid as at the publication date for this combined management report.

Deutsche Börse AG (disclosures based on the HGB)

The annual financial statements of Deutsche Börse AG are prepared in accordance with the provisions of the German Commercial Code (Handelsgesetzbuch, HGB) and the supplementary provisions of the German Stock Corporation Act (Aktiengesetz, AktG) and are the underlying basis for the explanations that follow.

Business and operating environment

General position
Deutsche Börse AG is the parent company of Deutsche Börse Group. The parent company's business activities include first and foremost the cash and derivatives markets, which are reflected in the Eurex (financial derivatives) and Xetra (cash equities) segments, as well as the data and index businesses. Deutsche Börse AG also operates essential parts of Deutsche Börse Group's information technology. The development of Deutsche Börse Group's Clearstream (post-trading) segment is reflected in Deutsche Börse AG's business development, primarily due to the profit and loss transfer agreement with Clearstream Holding AG. Deutsche Börse Group's IFS (investment fund services) and GSF (collateral management) segments, in contrast, play a lesser role for Deutsche Börse AG. Nonetheless, Deutsche Börse AG's business and operating environment is essentially the same as that of Deutsche Börse Group; this is described in the "Macroeconomic and sector-specific environment" section.

Deutsche Börse AG's course of business in the reporting period
Deutsche Börse AG's revenues have increased by 1.9 per cent in the 2019 financial year, coming in below the company's expectations. Total costs (staff costs, amortisation of intangible assets and depreciation of property, plant and equipment and other operating expenses) decreased by 4 per cent. Our volume of new business has risen by just under 55.2 per cent over the same period of the previous year. Deutsche Börse AG's Executive Board considers the company's performance during the 2019 financial year as satisfactory.

Performance figures for Deutsche Börse AG

	2019 €m	2018 €m	Change %
Sales revenue	1,423.5	1,396.5	1.9
Total costs	884.6	921.2	– 4.0
Net income from participations held	542.9	242.3	124.1
EBITDA	1,181.2	831.2	42.1
Net profit for the period	825.9	532.2	55.2
Earnings per share (€)	4.50[1]	2.88[1]	56.3

1) Calculation based on weighted average of shares outstanding

Sales revenue by segment

	2019 €m	2018 €m	Change %
Eurex (financial derivatives)	854.5	836.6	2.1
EEX (commodities)	14.8	13.5	9.6
360T (foreign exchange)	0.4	2.9	– 85.2
Xetra (cash equities)	222.1	229.8	– 3.3
Clearstream (post-trading)	83.8	75.7	10.7
IFS (investment fund services)	15.0	8.7	72.3
GSF (collateral management)	7.8	3.1	152.3
Qontigo (index business)	25.3	27.4	– 7.6
Data (data business)	199.7	198.8	0.5
Total	**1,423.5**	**1,396.5**	**1.8**

Results of operations of Deutsche Börse AG

Deutsche Börse AG's net revenue rose by 1.9 per cent in 2019 to €1,423.5 million (2018: €1,396.5 million). At €854.5 million (2018: €836.6 million), the largest contribution to revenue came from the Eurex (financial derivatives) segment. The breakdown of revenue by company segment is provided in the "Sales revenue by segment" table.

For more information on the development of the Eurex (financial derivatives) segment, please refer to the "Eurex (financial derivatives) segment" section.

The revenue contributed by the EEX (commodities) and 360T (foreign exchange) segments is generated mainly by IT services. Therefore, the explanations in the "EEX (commodities) segment" and "360T (foreign exchange) segment" sections relate only indirectly to Deutsche Börse AG. The earnings situation of the Data and Qontigo (index business) segments is shown in the "Data segment" and "Qontigo (index business) segment" sections. It is worth noting that the business development of the STOXX Ltd. subsidiary does not directly impact upon the business performance of Deutsche Börse AG. An explanation of the business development in the Xetra (cash equities) segment can largely be found in the "Xetra (cash equities) segment" section. Revenues attributable to the Clearstream (post-trading), IFS (investment fund services) and GSF (collateral management) segments result from the IT services Deutsche Börse AG provides to companies belonging to the Clearstream Holding subgroup.

Other operating income decreased to €36.3 million during the year under review (2018: €54.3 million).

The company's total costs of €884.6 million were down 4 per cent year-on-year (2018: €921.2 million). For a breakdown, please refer to the table "Overview of total costs". Staff costs were down by 17.5 per cent year-on-year during the year under review, to €248.6 million (2018: €301.5 million). The decline in staff costs is mainly due to the restructuring programme and streamlining of the management structure. Furthermore, additions to pension provisions decreased by €9.8 million, which was due to changed framework conditions. The staff numbers increased from an average of 1,437 in the prior year to 1,472 in the 2019 financial year.

Amortisation of intangible assets and depreciation of property, plant and equipment increased to a total of €59.1 million in the year under review (2018: €57.8 million).

Other operating expenses were up 2.7 per cent year-on-year, to €576.9 million (2018: €561.9 million).

Deutsche Börse Group's result from equity investments for the 2019 financial year totalled €542.9 million (2018: €242.3 million) and, among others, consisted of dividend income of €305.7 million (2018: €90.6 million), income from the transfer of profits in the amount of €228.1 million (2018: €152.7 million) and a loss absorption from profit and loss transfer agreements of €3.9 million.

Earnings before interest, tax, depreciation and amortisation (EBITDA) increased to €1,181.2million (2018: €831.2 million). Net profit for the period amounted to €825.9 million, representing an increase of 55.2 per cent (2018: €532.2 million).

Development of profitability
Deutsche Börse AG's return on equity expresses the ratio of net income after taxes to average equity available to the company during the course of 2019. Return on equity increased from 21 per cent in 2018 to 29.9 per cent in the year under review.

Financial position of Deutsche Börse AG

As at the reporting date, cash and cash equivalents amounted to €849.3 million (2018: €716.5 million) and included bank deposits on current accounts as well as term deposits and other short-term deposits.

Deutsche Börse AG has external credit lines available of €605.0 million (2018: €605.0 million), which were not yet drawn upon as at 31 December 2019. Moreover, the company has a Commercial Paper programme in place, which allows for flexible and short-term financings of up to €2.5 billion, in various currencies. At the end of the year, there was no Commercial Paper outstanding.

Through a Group-wide cash-pooling system, Deutsche Börse AG ensures an optimum allocation of liquidity throughout Deutsche Börse Group; in this way, the parent entity makes sure that all subsidiaries are in a position to honour their payment obligations at any time.

Deutsche Börse AG has issued three corporate bonds with a nominal value of €600 million each and one corporate bond with a nominal value of €500 million. For more details concerning these bonds, please refer to the "Financial position" section.

In the 2019 financial year, Deutsche Börse AG generated cash flow from operating activities of €945.1 million (2018: 642.3 million), mainly thanks to higher net profit.

Cash flow from investing activities amounted to €495.0 million (2018: €444.1 million). This increase is strongly correlated with the capital reduction of Eurex Global AG (€442.3 million) and STOXX Ltd. (€50.1 million). In addition, the Index Business was spun off into Qontigo Index GmbH (€14.0 million).

Cash flow from financing activities amounted to €–486.1 million in the year under review (2018: €–807.8 million). In the 2019 financial year, Deutsche Börse AG distributed €495 million in dividends for the year 2018. Cash and cash equivalents amounted to €47.3 million on the 31 December 2019 reporting date (2018: €–906.6 million) and consisted of liquid funds of €849.3 million (2018: €716.5 million), less cash-pooling liabilities of €801.9 million (2018: €1,623.1 million).

Overview of total costs

	2019 €m	2018 €m	Change %
Staff costs	248.6	301.5	– 17.5
Depreciation and amortisation	59.1	57.8	2.3
Other operating expenses	576.9	561.9	2.7
Total	**884.6**	**921.2**	**– 4.0**

Cash flow statement (condensed)

	2019 €m	2018 €m
Cash flows from operating activities	945.0	642.3
Cashflow from investing activities	495.0	– 444.1
Cashflow from financing activities	– 486.1	– 807.8
Cash and cash equivalents as at 31 December	**47.3**	**– 906.6**

Net assets of Deutsche Börse AG

As at 31 December 2019, the non-current assets of Deutsche Börse AG amounted to €5,349.8 million (2018: €5,892.9 million). At €5,007.5 million, most of the non-current assets was attributable to shares in affiliated companies (2018: €5,520.9 million), mainly from the investment in Clearstream Holding AG, in 360 Treasury Systems AG, in Eurex Frankfurt AG as well as the investment in Qontigo GmbH.

Deutsche Börse AG's investments in intangible assets and property, plant and equipment totalled €60.4 million during the year under review (2018: €56.1 million). This rise was related to payments on account for construction in progress in various locations. Depreciation and amortisation in 2019 amounted to €59.2 million (2018: €57.8 million).

Receivables from and liabilities to affiliated companies include settlements for intra-Group services and amounts invested by Deutsche Börse AG within the scope of cash-pooling arrangements. Apart from settlements for intra-Group services, receivables from affiliated companies are largely due from Qontigo GmbH and Qontigo Index GmbH. This is on account of the spin-off of the Index Business into Qontigo Index GmbH and the associated establishment of Qontigo GmbH. In total, these items amount to €80.4 million. Liabilities to affiliated companies resulted mainly from cash-pooling amounting to €801.9 million (2018: €1,623.1 million) and trade liabilities in the amount of €46.1 million (2018: €43.9 million).

Working capital amounted to €–903.5 million in 2019 (2018: €–1,652.9 million). The change was mainly attributable to a decrease in liabilities from cash pooling.

Non-current assets (condensed)

	2019 €m	2018 €m
Intangible assets	108.5	117.9
Property, plant and equipment	85.6	74.9
Financial assets	5,155.7	5,700.1
Non-current assets as at 31 December	**5,349.8**	**5,892.9**

Employees per country/region

	31 Dec 2019	%
Germany	1,484	98.0
Great Britain	20	1.3
France	5	0.3
Other European countries	4	0.3
Asia	2	0.1
Total Deutsche Börse AG	**1,515**	**100**

Deutsche Börse AG employees

The number of employees at Deutsche Börse AG rose by 74 in the reporting year and totalled 1,515 as at 31 December 2019 (31 December 2018: 1,469 employees). The average number of employees at Deutsche Börse AG for the 2019 financial year was 1,472 (2018: 1,437).

During the 2019 financial year, 93 employees left Deutsche Börse AG, resulting in a staff turnover rate of 6 per cent.

On 31 December 2019, Deutsche Börse AG had employees at six locations around the world. Information on the countries, regions, the employees' age structure and length of service are provided in the tables that follow.

As at 31 December 2019, 77 per cent of Deutsche Börse AG's employees were graduates. The ratio is based on the number of employees holding a degree from a university, college or vocational academy, as well as the employees who have completed degrees abroad. In 2019, the company invested an average of 4.0 days in training per employee.

Age structure of employees

	31 Dec 2019	%
Less than 30 years	177	11.7
30 to 39 years	466	30.8
40 to 49 years	401	26.4
More than 50 years	471	31.1
Total Deutsche Börse AG	**1,515**	**100**

Employee length of service

	31 Dec 2019	%
Less than 5 years	688	45.4
5 to 15 years	340	22.4
More than 15 years	487	32.2
Total Deutsche Börse AG	**1,515**	**100**

Remuneration report of Deutsche Börse AG

The principles governing the structure and design of the remuneration system at Deutsche Börse AG are the same as those for Deutsche Börse Group. Therefore, please refer to the remuneration report for Deutsche Börse Group.

Corporate governance statement in accordance with section 289f HGB

The corporate governance statement in accordance with section 289f HGB corresponds to that of Deutsche Börse Group. Therefore, please refer to the "Combined corporate governance statement and corporate governance report" section.

Opportunities and risks facing Deutsche Börse AG

The opportunities and risks facing Deutsche Börse AG, as well as the measures and processes for dealing with these opportunities and risks, are essentially the same as those for Deutsche Börse Group. Therefore, please refer to the risk report and the report on opportunities of Deutsche Börse Group. In principle, Deutsche Börse AG participates in the opportunities and risks of its equity investments and subsidiaries in proportion to the size of its shareholding. Risks that could potentially threaten the existence of the Eurex Clearing AG subsidiary would also have had a direct influence on Deutsche Börse AG based on a letter of comfort issued by Deutsche Börse AG. As of the reporting date, there were no risks jeopardising the company's existence. Further information on the letter of comfort issued to Eurex Clearing AG is available in the "Other financial obligations and transactions not included in the balance sheet" section in the notes to the annual financial statements of Deutsche Börse AG.

The description of the internal control system (ICS), required by section 289 (4) of the HGB, is provided in the "Group management" section.

Report on expected developments at Deutsche Börse AG

The expected developments in Deutsche Börse AG's business are largely subject to the same factors as those influencing Deutsche Börse Group. The relevant disclosures and quantitative information on Deutsche Börse AG are provided in the report on expected developments.

Remuneration report

This remuneration report outlines the principles governing the remuneration system applicable to the members of Deutsche Börse AG's Executive Board: it also describes the structure and amount of remuneration payable to them, together with the principles governing Supervisory Board remuneration, and the amounts payable. The remuneration report is part of the combined management report and complies with the requirements of the Handelsgesetzbuch (HGB, German Commercial Code), the International Financial Reporting Standards (IFRSs) and German Accounting Standard No. 17 (Reporting on the Remuneration of Members of Governing Bodies). In addition, the remuneration report (including the remuneration systems for the Executive Board and the Supervisory Board outlined therein) complies with almost all recommendations of the German Corporate Governance Code (the "Code") as amended on 7 February 2017 (the "GCGC 2017); for details, please refer to the "Combined corporate governance statement and corporate governance report". The remuneration report (including the remuneration systems for the Executive Board and the Supervisory Board) also complies with almost all recommendations of the Code as amended on 16 December 2019 (the "GCGC 2020"); compliance will increase even further for the remuneration systems for the Executive Board and the Supervisory Board adjusted with effect from the 2020 financial year.

The remuneration report comprises two sections: "Remuneration systems for the Executive Board and the Supervisory Board" and "Total remuneration and remuneration amounts for the Executive Board and the Supervisory Board".

Remuneration systems for the Executive Board and the Supervisory Board

Remuneration system for the Executive Board

General principles

The Supervisory Board, being advised by its Nomination Committee, determines the remuneration system for the members of the Executive Board. The remuneration system adopted by the Supervisory Board is submitted to the Annual General Meeting. The Supervisory Board reviews the remuneration system on a regular basis, supported by its Nomination Committee, and submits the remuneration system to the Annual General Meeting for approval in the event of any material changes – in any case, every four years. The Supervisory Board may retain the support of independent external experts when necessary. Deutsche Börse Group's rules for avoiding and dealing with conflicts of interest are also applicable to the procedures for determining, implementing and reviewing the remuneration system. Where conflicts of interest occur in exceptional cases, they must be disclosed: affected Board members may be excluded from discussion and decision-making processes, amongst other consequences.

The previous remuneration system for the Executive Board members was adopted by the Supervisory Board, effective 1 January 2016, and was approved by the Annual General Meeting on 11 May 2016 in accordance with section 120 (4) of the Aktiengesetz (AktG, German Stock Corporation Act) (old wording). This remuneration system was adjusted in some areas, effective 1 January 2020, by way of a Supervisory Board resolution; the adjusted remuneration system will be submitted to the Annual General Meeting on 19 May 2020 for approval in accordance with section 120a (1) of the AktG. This remuneration report contains additional explanations of the adjustments applicable from the 2020 financial year onwards; besides these adjustments, the amended remuneration system for the Executive Board is in line with the system in force to date.

Executive Board remuneration is set by the Supervisory Board, on the basis of the remuneration system in force; the Nomination Committee is responsible for preparing the Supervisory Board's decision. In doing so, the Supervisory Board shall ensure that remuneration is appropriate to the corresponding Executive Board member's tasks and performance, as well as to the enterprise's financial situation, and that it does not exceed the prevailing market level of remuneration without specific reasons. For this purpose, the Supervisory Board shall conduct a horizontal and vertical peer-group comparison on a regular basis (at least every two years); see the section on "Examination of appropriateness of Executive Board remuneration (peer-group comparison)" for details.

Targets and reference parameters set by the Supervisory Board for variable remuneration components for each new financial year may not be changed retrospectively.

A target remuneration in line with prevailing market levels is assigned to each Executive Board member. This target remuneration is predominantly oriented upon the skills and experience required for that member's tasks, as well as upon the target remuneration for the other Executive Board members. The remuneration for the Chairman of the Executive Board (Chief Executive Officer) is roughly double the target remuneration for the other Executive Board members.

Implementation of the remuneration system adjusted with effect from the 2020 financial year
The adjusted remuneration system for the Executive Board applies to all service contracts with Executive Board members entered into or extended on or after 1 January 2020. In accordance with the GCGC 2020 and section 26j of the Einführungsgesetz zum Aktiengesetz (EGAktG, Introductory Law to the German Stock Corporation Act), the existing remuneration system shall continue to apply to all existing service contracts with members of the Executive Board. Executive Board members are remunerated in accordance with the remuneration system applicable to them.

Contribution to promoting the corporate strategy and supporting the long-term development of the company.
Within the framework of its corporate strategy, Deutsche Börse's goal is to strengthen – and further expand – its position as a leading European financial markets infrastructure provider with global growth ambitions over the long term. Hence, the company's primary strategic focus is on growth. Deutsche Börse Group aligns its actions with long-term and sustainable company success, discharging its corporate responsibility holistically.

In line with these targets, the remuneration system for the Executive Board is based on three pillars: firstly, a clear performance orientation and a highly detailed assessment based on ambitious internal and external targets ensure the focus is on the company's goal of above-average growth. Secondly, multi-year bases for assessment, long-term elements, and the use of deferred payouts discourage excessive risk-taking. Thirdly, the new remuneration system promotes a strong equity culture, and in this way helps align the interests of shareholders, management and other stakeholders. Particularly the individual targets set incentives for sustainable action.

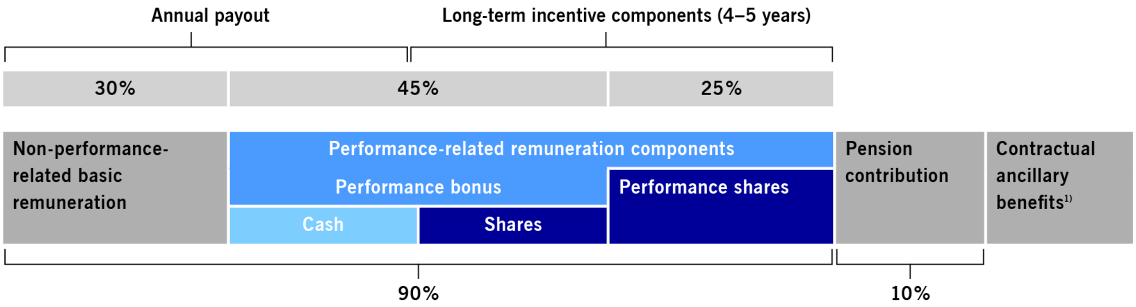
Within the scope of the remuneration system adjusted as of 1 January 2020, the Supervisory Board is entitled to temporarily deviate from the remuneration system pursuant to section 87a (2) of the AktG if it is necessary for the sake of the company's long-term wellbeing. Such a deviation requires a resolution adopted by the Supervisory Board with a two-thirds majority – based on a recommendation made by the Nomination Committee – listing the reasons and the type of deviation on a case-by-case basis. Based on such a resolution, deviations from the remuneration system are possible for all remuneration components. The maximum remuneration however cannot be touched.

Structure and remuneration components
The remuneration system for Executive Board members consists of four components:

- Non-performance-related basic remuneration
- Performance-related remuneration components
- Contractual ancillary benefits
- Pension contribution

On aggregate, the four components set out above represent the target total remuneration. Non-performance-related basic remuneration plus performance-related remuneration components are equivalent to target direct remuneration (also refer to the chart below: "Composition of target direct remuneration and target total remuneration").

Composition of the target direct compensation and the target total remuneration



% = Proportion of the target direct compensation and of the target total remuneration respectively (schematic)
■ Non-performance-related component (cash component)
■ Performance-related component (cash component)
■ Performance-related component (share-based payment)

[1] Up to approx. 2 % of the target total remuneration

In addition, the company's share ownership guidelines require Executive Board members to invest a substantial amount of money in Deutsche Börse AG shares during their term of office.

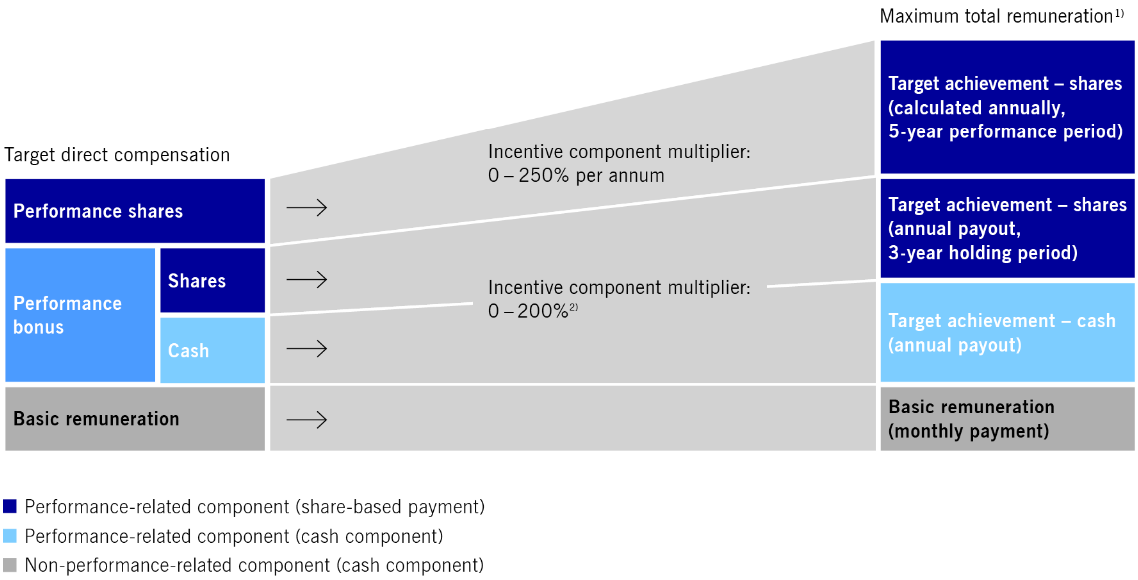
The individual remuneration system components for the Executive Board are explained in detail below.

Non-performance-related basic remuneration
The members of the Executive Board receive a fixed base salary, which is payable in twelve equal monthly instalments. This non-performance-related remuneration comprises approximately 30 per cent of the target direct remuneration payable each year.

Performance-related remuneration components

Performance-related remuneration accounts for approxi
for the year and is largely share-based. It predominantly covers a period of several years and comprises a performance bonus and performance shares. Performance-related remuneration is largely calculated on a long-term basis, with various target criteria being assessed over a period of five years (performance shares) or four years (share-based performance bonus: one-year performance period and three-year holding period for shares to be invested). The cash component of the performance bonus (annual payout) is the only short-term variable remuneration component (see also the "Basic remuneration, and annual and long-term incentive components" chart).

Basic remuneration, and annual and long-term incentive components



[1] Together with pension expenses and ancillary benefits subject to maximum remuneration

[2] As of fiscal year 2020: 0 to 233%

Performance bonus

The performance bonus is calculated on the basis of Deutsche Börse AG's Performance Bonus Plan (PBP). It accounts for roughly two-thirds of Executive Board members' performance-related remuneration and for approximately 45 per cent of their target direct remuneration. The performance bonus is split 50:50 between a share-based component (the share-based performance bonus) and a cash component.

Performance shares

Performance shares are calculated and granted on the basis of the Performance Share Plan (PSP). They are paid out after the reporting period since they reflect the performance of Deutsche Börse AG's share price over a five-year performance period. Performance shares account for approximately one-third of Executive Board members' performance-related remuneration, and for approximately 25 per cent of their target direct remuneration.

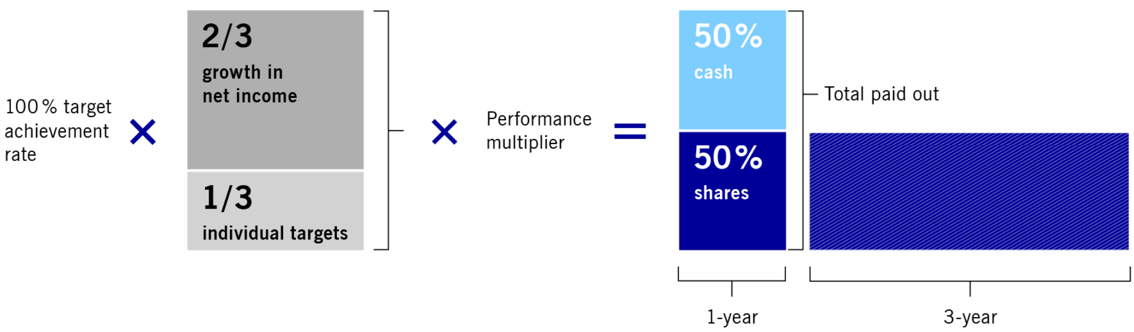
The criteria used by the Supervisory Board to assess the extent to which Executive Board members have met their individual targets are described below. These criteria are used to calculate the performance bonus due to Executive Board members, as well as the number of performance shares to be granted and their value.

Principles governing the PBP and assessing target achievement for the performance bonus
Based on the PBP, a performance bonus with a certain target value is indicated to the Executive Board members for each year. The extent to which Executive Board members have met their targets for the performance bonus is determined for each financial year on the basis of the PBP. The basic assessment procedure is based on two components: two-thirds of the bonus consider the increase in adjusted net profit attributable to Deutsche Börse AG shareholders for the remuneration year concerned (hereinafter referred to as net income) and thus reflect Deutsche Börse AG' strategic growth orientation. One-third reflects the Executive Board members' individual performance which is assessed particularly with a view to whether strategic and operating targets with strategic relevance were achieved. This way, the performance bonus recognises the implementation of Deutsche Börse AG's business strategy, thus contributing to the company's long-term development.

Once the Supervisory Board has determined the overall extent to which Board members have met their targets using these two components, it may then review this figure and adjust it using a performance multiplier in exceptional situations if so required; this can be done either for individual Executive Board members or for the Executive Board as a whole. Please refer to the "Determining the performance multiplier" section.

The total performance bonus is paid out in cash, at the latest together with the regular salary payment for the calendar month following the approval of Deutsche Börse AG's consolidated financial statements for the year. Executive Board members are obliged to invest 50 per cent of the total payout after tax in Deutsche Börse AG shares, which they have to hold for at least three years. For further details regarding the share purchase process, please refer to the section "Automated share purchase designed to fulfil the plan conditions as well as the share ownership guidelines".

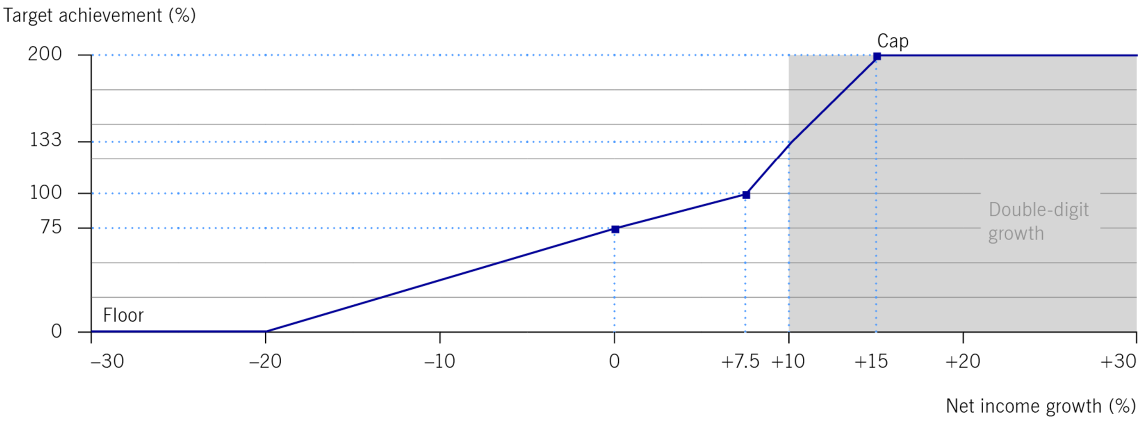
Breakdown of the performance bonus



Assessing the adjusted net income growth

Net income growth is calculated independently from the financial planning concerned by comparing the adjusted net income for the remuneration year with the prior-year figure. Target achievement rates may range between 0 and 200 per cent: net income decrease of 20 per cent or more corresponds to a 0 per cent target achievement rate (floor). Where net income remains stable (i.e. unchanged year-on-year), this is deemed to represent a target achievement rate of 75 per cent, while a 7.5 per cent increase is equivalent to a target achievement rate of 100 per cent (target value). Net income growth of 15 per cent or more corresponds to a 200 per cent target achievement rate (cap). This means that there is a stronger incentive to achieve net income growth of between 7.5 per cent and 15 per cent, because the target achievement curve is steeper (see the following "Assessing net income for the performance bonus" chart).

Assessing net income growth for the performance bonus



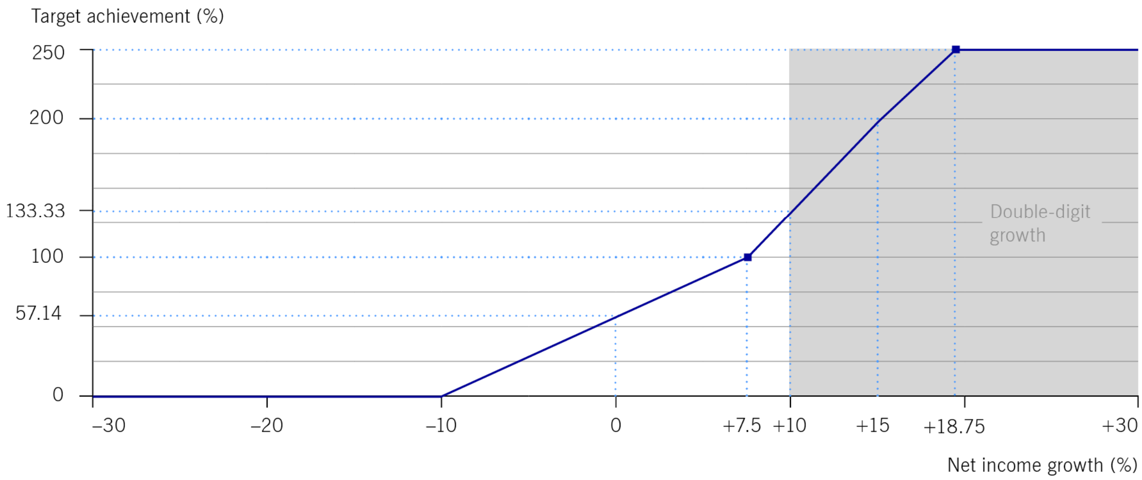
PBP adjustments as of the 2020 financial year

Under the remuneration system in force from the 2020 financial year onwards, the net income assessment to determine target achievement for the performance bonus was adjusted. By carrying out these amendments, the Supervisory Board once again increases the incentive for above-average net income growth.

On the one hand, the floor for a performance bonus payout was elevated, meaning that in future a net income decrease of 10 per cent or more corresponds to a 0 per cent target achievement rate (previously: 20 per cent and more). According to the Supervisory Board's view, the thus steeper and now linear target achievement curve (see the following chart "Assessing net income for the performance bonus as of 1 January 2020") between floor and target value better reflects Deutsche Börse AG's desired performance culture. At the same time, the Supervisory Board continues to deem the floor of a slightly decreasing net income for the one-year performance period to be appropriate. Such net income fluctuations are often also based on external factors and should not lead to a total loss of the performance bonus.

In addition, the maximum performance bonus as of 1 January 2020 shall only be granted as of minimum net income growth amounting to 18.75 per cent (previously: 15 per cent). The cap was also elevated, from 200 per cent to 250 per cent, to reward above-average net income growth even more.

Assessing net income growth for the performance bonus as of 1 January 2020



Determining individual targets and assessing the target achievement
The Supervisory Board defines the Executive Board members' individual targets and their weighting for the upcoming financial year (and in the event that a member is elected during the year, as of the appointment date). Individual targets can also be determined for the entire Executive Board.

Individual targets should contribute to an implementation of the corporate strategy as well as to a long-term, sustainable development at Deutsche Börse Group. Targets must be demanding and ambitious. Furthermore, they must be specific enough to allow for target achievement to be measured, i.e. specific figures or expectations for target achievement are determined. To avoid dilution, each Executive Board member shall have no more than four targets per year.

The targets are derived from the Group or corporate strategy or its respective parts and comprise their implementation. Strategic projects and initiatives can directly serve to implement the corporate strategy, as can operating measures. The latter can also be agreed as targets if they indirectly contribute to strategy implementation, for example by creating an essential foundation for the company's structure, organisation, function and long-term development.

The performance criteria to be used by the Supervisory Board within the scope of the annual target agreement can be financial as well as non-financial and must include at least one performance criterion from the catalogue of sustainability topics (including ecological and social aspects) per year, provided the Supervisory Board doesn't refrain from this due to special circumstances in individual cases.

Catalogue of performance criterions

Corporate strategy implementation	Sustainability
Objectives of the corporate strategy	Customer satisfaction
Business development	Employee satisfaction
Product development and innovation	Diversity
Gaining market share	Risk management
Exploring new markets	Compliance
Strategic projects	Corporate governance
M&A	Corporate Social Responsibility
Company structure, organisation, and function	Carbon emission reduction/considerate use of resources
Efficiency enhancement	Reporting and communication
Liquidity planning	Succession planning

Advised by the Nomination Committee, the Supervisory Board assesses the extent to which each member of the Executive Board has achieved his or her targets after the end of the remuneration year in question. A floor of 0 per cent and a cap of 200 per cent have been defined for the target achievement rate of individual targets.

The individual targets for the Executive Board members for the 2020 financial year were determined in accordance with the adjusted remuneration system. The target agreement includes both targets regarding the implementation of Deutsche Börse AG's growth strategy "Roadmap 2020" and sustainability targets alike. The individual targets determined for and the target achievement rate of the Executive Board members are reported in a transparent manner following the remuneration year.

Determining the performance multiplier

The performance multiplier for the performance bonus supports the Supervisory Board in special situations when considering additional success and performance aspects hitherto not sufficiently comprised in the previously determined targets. As such, the performance multiplier can be used e.g. in the event of mergers, acquisitions or divestments to allow the Supervisory Board to account for any dilution of equity, or to reflect the achievement of qualitative or quantitative targets (especially integration parameters) when finally assessing the extent to which an Executive Board member has achieved his or her overall targets. The performance multiplier has a minimum value of 0.8 and a maximum value of 1.2; it is multiplied by the performance assessment for the performance bonus, taking the 200 per cent cap (as of 2020 financial year: 233.33 per cent) into account.

Principles governing the PSP and assessing target achievement for performance shares

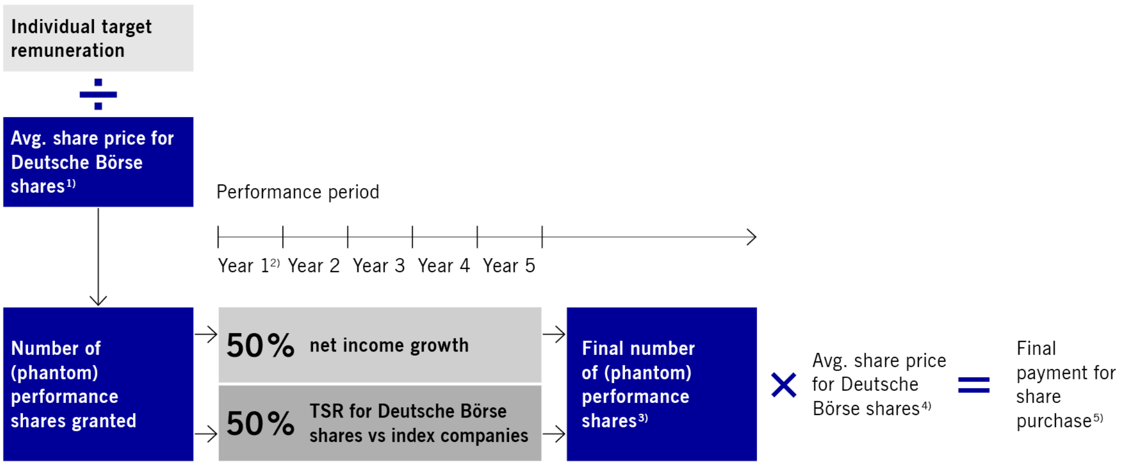
At the beginning of each financial year, the PSP allots a potential number of so-called performance shares to each member of the Executive Board. The number of initial (phantom) performance shares thus allotted is determined by dividing the amount of the individual target remuneration (in euros) by the average Xetra® closing price of Deutsche Börse shares in the calendar month preceding the start of the performance period (fair value of the performance shares). Target achievement regarding performance shares is determined after the end of a five-year performance period. The respective target achievements are assessed on the basis of two components: firstly, the adjusted net income growth over the five-year period, and, secondly, the relative total shareholder return (TSR) for Deutsche Börse shares compared to the TSR for the STOXX® Europe 600 Financials index (the industry benchmark) during the same period. The PSP thus supports the implementation of the growth-oriented corporate strategy on the one hand and especially Deutsche Börse AG's long-term development via the long-standing performance period on the other.

The final number of phantom performance shares is determined from the total target achievement rate for net income growth and TSR performance during the performance period, multiplied by the number of (phantom) performance shares granted at the outset. The final number of phantom performance shares determined in this manner is multiplied by the average Xetra closing price for Deutsche Börse shares in the calendar month preceding the end of the performance period. This results in the amount to be paid out to purchase the tradeable shares (adjusted for the dividends per share paid out during the performance period). Each payout amount is generally due in three equal instalments: the first instalment is due at the latest together with the regular salary payment for the calendar month following the approval of Deutsche Börse AG's consolidated financial statements for the year after the end of the performance period in question; the second and third instalments are due at the corresponding dates in the two years subsequent to the payment of the first instalment. The members of the Executive Board are obliged to invest the amount paid out after tax in Deutsche Börse AG shares. For further details regarding the share purchase process, please refer to the section "Automated share purchase designed to fulfil the plan conditions as well as the share ownership guidelines".

The PSP has two variables:

- The first variable is the number of performance shares which is derived from the net income growth and from the TSR for Deutsche Börse shares in comparison to the TSR of the reference index, over a five-year period in each case. The maximum number of performance shares is limited at 250 per cent of the number of performance shares determined at the beginning of the performance period.
- The second variable is the change in the share price and the dividend during the performance period; no cap is applied to the share price.

Principles governing the Performance Share Plan (PSP)



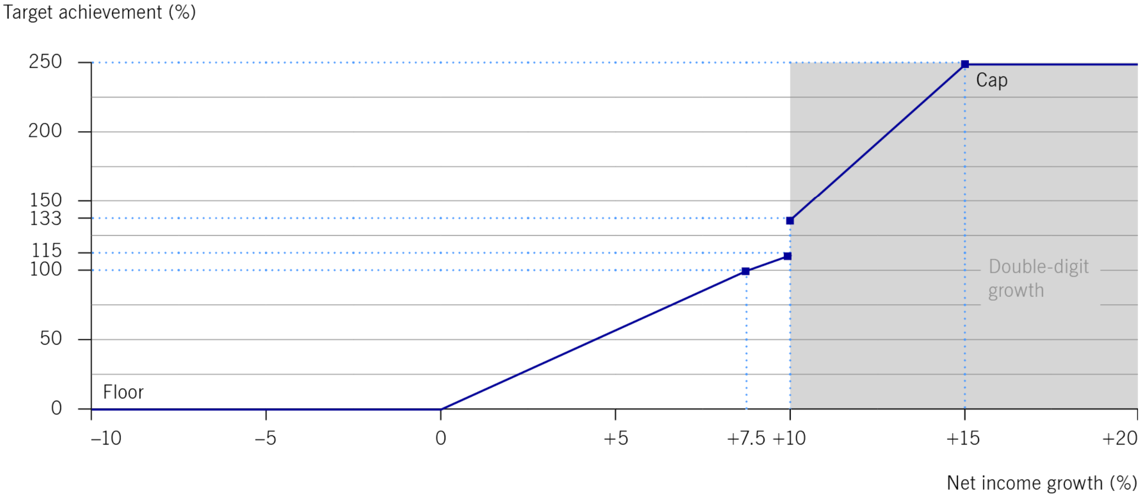
Absolute KPI
Relative KPI

[1] In the calendar month preceding the start of the performance period
[2] Year in which performance shares are granted
[3] Limitation at 250 per cent of number granted
[4] In the last calendar month of the performance period, including all dividends paid during the performance period
[5] Due in three tranches

Assessing net income for performance shares

The Supervisory Board determines the target achievement rate for adjusted net income growth at the end of each financial year during the five-year performance period and determines them for the Executive Board members. The target achievement rate at the end of the performance period in question is the average of the annual target achievement rates for each of the five years. Target achievement rates may range between 0 and 250 per cent. If net income declines or remains unchanged year-on-year, this is deemed to represent a target achievement rate of 0 per cent (floor), while a 7.5 per cent increase corresponds to a target achievement rate of 100 per cent. Net income growth of 15 per cent or more corresponds to a 250 per cent target achievement rate (cap). The target achievement rate increases more strongly for growth rates between 10 and 15 per cent than for single-digit growth rates, providing a greater incentive for Executive Board members to aim for double-digit net income growth (see also the following chart “Assessing net income growth for performance shares”).

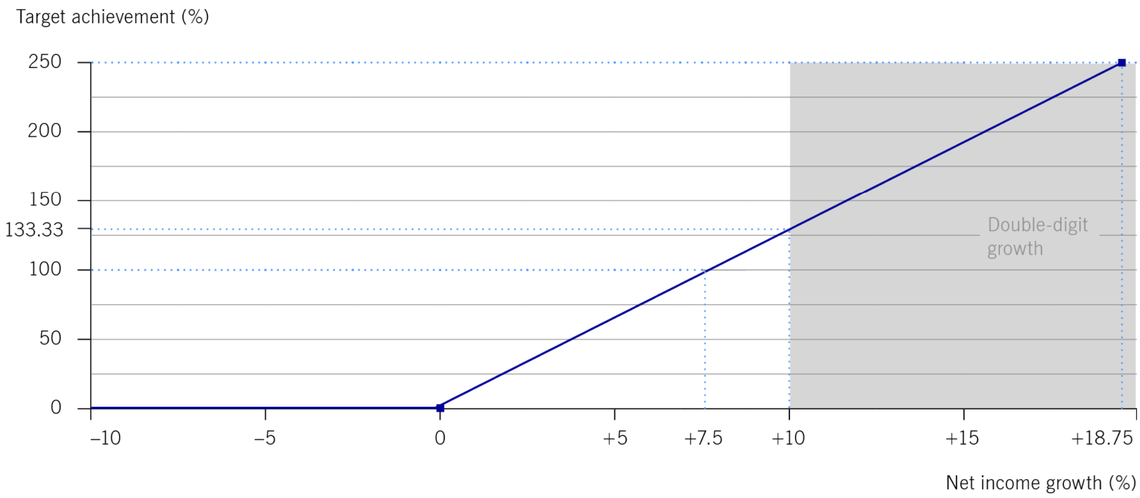
Assessing net income growth for performance shares



PSP adjustments regarding net income growth as of the 2020 financial year
The remuneration system valid as of financial year 2020 has also been amended with regard to assessing net income for the PSP. These adjustments refer to the performance periods beginning as of this point in time. Net income growth required to achieve the cap was lifted from 15 per cent to 18.75 per cent, whilst the target achievement cap of 250 per cent was maintained. The Supervisory Board thus increases the demands for maximum target achievement regarding net income growth under the Performance Share Plan.

Furthermore, as of financial year 2020 the target achievement curve is completely linear between floor and cap. Therefore, the higher target achievement rate of 133 per cent in the hitherto non-linear target achievement curve disappears if net income increases by 10 per cent (see the following chart "Assessing net income growth for performance shares as of 1 January 2020").

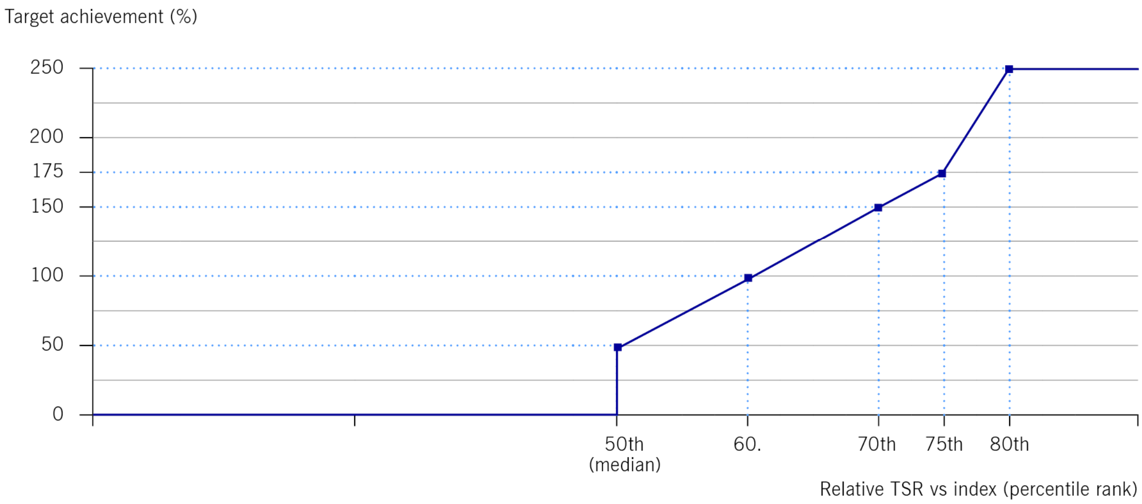
Assessing net income growth for performance shares as of 1 January 2020



Assessing the TSR performance for Deutsche Börse shares

The TSR performance for Deutsche Börse shares is derived from Deutsche Börse AG's ranking relative to the companies included in the STOXX Europe 600 Financials index. The target achievement rates for Executive Board members can range from 0 per cent (floor) to 250 per cent (cap). A zero per cent target achievement rate is assumed where Deutsche Börse AG's five-year relative TSR falls short of the median, i.e. where it is lower than that for at least half of the index constituents. Where Deutsche Börse AG's TSR has performed in line with 60 per cent of index constituents, this represents a target achievement rate of 100 per cent. Where Deutsche Börse AG's TSR has performed in line with at least 75 per cent of index constituents, this represents a target achievement rate of 175 per cent. The cap of 250 per cent is reached if Deutsche Börse AG's TSR ranks in the top 20 per cent of index constituents – in other words, if it is in the 80th percentile of the index or higher. Please also refer to the following chart "Assessing the total shareholder return (TSR) for Deutsche Börse shares for performance shares".

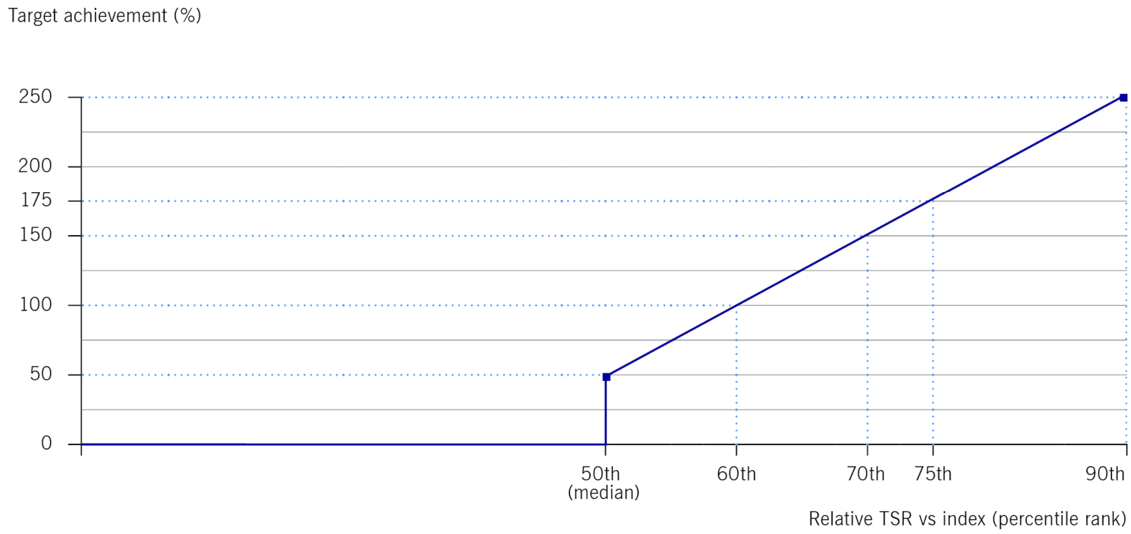
Assessing the total shareholder return (TSR) for Deutsche Börse shares for performance shares



PSP adjustments regarding TSR performance as of the 2020 financial year
As with assessing net income, the cap for total shareholder return as a second performance indicator of the Performance Share Plan was left at 250 per cent, albeit with a higher target achievement. To reach the cap, Deutsche Börse AG's TSR must in future lie at or above the TSR of at least 90 per cent of companies included in the benchmark index (until financial year 2020: 80 per cent). The Supervisory Board thereby also increases the total shareholder return demands for maximum target achievement under the Performance Share Plan.

In line with the target achievement curve for net income growth, the curve for TSR performance was also adjusted and is linear now.

Assessing the total shareholder return (TSR) for Deutsche Börse shares
for performance shares as of 1 January 2020



Contractual ancillary benefits
Contractual ancillary benefits are granted to members of the Executive Board, such as the provision of an appropriate company car for business and personal use. They also receive taxable contributions towards private pensions. In addition, the company may take out insurance cover for them (within reason). Currently this includes personal accident insurance and directors & officers (D&O) insurance for Executive Board members. Other ancillary benefits may include a temporary or permanent reimbursement of expenses for a second household, journeys home, moving costs, cost coverage for security measures and the use of pool vehicles or transport services.

Pension commitments

Retirement benefits
The members of the Executive Board are generally entitled to receive retirement benefits upon reaching the age of 60, provided that they are no longer in the service of Deutsche Börse AG at that time – for Thomas Book, this applies on reaching the age of 63. The Supervisory Board reviews and determines the pensionable income that is used as the basis for retirement benefits. There are two different retirement benefit systems for Executive Board members. Executive Board members normally receive a defined contribution pension. Those members who continue being subject to an existing agreement from prior appointments within Deutsche Börse Group may instead receive a defined benefit pension. The pensionable income and the present value of the pension commitments existing as at 31 December 2019 are shown in the “Retirement benefits” table.

Defined contribution pension system: For Executive Board members covered by the defined contribution pension system, the company makes an annual capital contribution to the scheme for each calendar year that a member serves on the Executive Board. This contribution is determined by applying an individual percentage (known as the “replacement rate”) to the pensionable income. The pensionable income is determined and regularly reviewed by the Supervisory Board. The annual capital contributions calculated in this way bear interest of 3 per cent per annum. Benefits are generally paid in the form of a monthly pension, however, Executive Board members have the option of choosing a one-off capital payment or five instalments. Pension entitlements are vested in accordance with the

Betriebsrentengesetz (German Company Pensions Act). The defined contribution pension system applies to Theodor Weimer, Christoph Böhm, Stephan Leithner, Gregor Pottmeyer and Hauke Stars.

Defined benefit pension system: After reaching the contractually agreed retirement age, members of the Executive Board covered by the defined benefit pension system receive the replacement rate of their individual pensionable income as a pension. A precondition for this is that the Executive Board member in question served on the Executive Board for at least three years and was reappointed at least once. As with the defined contribution pension system, the pensionable income is determined and regularly reviewed by the Supervisory Board. The replacement rate depends upon the Executive Board member's term of office and the number of reappointments and amounts to a maximum of 50 per cent. Payout terms and vesting rules are in line with those applicable for the defined contribution pension system. From among the active members of the Executive Board, the defined benefit pension system applies to Thomas Book.

Early retirement pension

Members of the Executive Board who have a defined benefit pension are entitled to an early retirement pension if the company does not extend their contract, unless the reasons for this are attributable to the Executive Board member or would justify termination without notice of the Executive Board member's contract. The amount of the early retirement pension is calculated in the same way as the retirement benefits – by applying the applicable replacement rate to the pensionable income. Once again, a precondition is that the Executive Board member served on the Executive Board for at least three years and was reappointed at least once. Members of the Executive Board who have a defined contribution pension are not eligible for an early retirement pension.

Permanent incapacity to work and death benefits

In the event that a member of the Executive Board becomes permanently incapable of working, the company is entitled to retire him or her. Executive Board members are deemed to be permanently incapable of working if they are unable to perform their professional activities for more than six months, and if they are not expected to regain their capacity to work within a further six months. In such cases, those Executive Board members who have a defined benefit pension plan receive the amount calculated by applying the applicable replacement rate to the pensionable income. Executive Board members with a defined contribution pension plan receive the plan assets that have accrued at the time when the benefits fall due, plus a supplement corresponding to the full annual pension contribution that would have been due in the year in which the Executive Board member left the company's service, multiplied by the number of years between the time at which the benefits fell due and the Executive Board member reaching the age of 60.

If an Executive Board member dies, his or her spouse receives 60 per cent and each dependent child receives 10 per cent of the above amount (25 per cent for full orphans), up to a maximum of 100 per cent of the pension contribution.

Transitional payments

In the event that an Executive Board member becomes permanently incapable of working, the defined benefit pension agreements for Executive Board members provide for a transitional payment. The amount of this payment corresponds to the target variable remuneration (performance bonus and performance shares) in the year in which the event triggering the benefits occurs. It is paid out in two tranches in the two following years. If an Executive Board member dies, his or her spouse receives 60 per cent of the transitional payment.

Share ownership guidelines

Deutsche Börse's share ownership guidelines are a key element in order ensure that remuneration for the Executive Board is aligned with the long-term corporate performance of Deutsche Börse AG, as provided for by the strategy. Under these guidelines, members of the Executive Board are obliged to continuously hold a multiple of their average basic remuneration in Deutsche Börse AG shares during their term of office. A multiple of 3 applies to the CEO, and a multiple of 2 to the Deputy CEO and to ordinary Executive Board members. Shares belonging to the following three categories are used to assess compliance with the share ownership guidelines: (1) shares purchased from the performance bonus; (2) shares received under the allocation of performance shares; and (3) shares held in private ownership. In each case, such shareholdings must be built up over a three-year period. The shareholdings of Mr Pottmeyer and Ms Stars were evaluated as at 31 December 2018 and were found to be compliant with the share ownership guidelines. Such compliance shall be evaluated on 31 December 2020 with regard to the shareholdings of Mr Weimer and on 31 December 2021 at the latest with regard to the shareholdings of Mr Böhm, Mr Book and Mr Leithner. For further details regarding the procedures for these share purchases, please refer to the section "Automated share purchase designed to fulfil the plan conditions as well as the share ownership guidelines".

Additional elements of the remuneration system for the Executive Board

Severance payments

In the event that an Executive Board member's contract of service is terminated early for a reason other than good cause, any payments made to the Executive Board member may not exceed the remuneration for the residual term of his or her contract of service, and may also not exceed the value of two total annual remuneration payments (severance cap). The payment is calculated on the basis of the total remuneration for the past financial year and, where appropriate, the expected total remuneration for the current financial year. Performance bonus claims and performance shares that have been granted will lapse if the company has good cause for an extraordinary termination of the Executive Board member's employment or if an Executive Board member terminates his or her contract before the end of the performance period without good cause and without reaching a mutual agreement.

Examination of appropriateness of Executive Board remuneration (peer-group comparison)

The Supervisory Board conducts a horizontal and vertical peer-group comparison to examine the appropriateness of Executive Board remuneration on a regular basis (at least every two years). For this purpose, the Supervisory Board may seek the advice of an external expert who is independent from the Executive Board and from the company. The horizontal comparison is based on a relevant peer group of reference companies; this may include DAX constituents, international exchange operators, national and international financial institutions, financial infrastructure providers or similar groups. When selecting peer groups for comparison, the Supervisory Board will consider, in particular, that such companies are comparable in size to Deutsche Börse AG. The vertical comparison concerns the relationship between Executive Board remuneration to the remuneration levels of senior management (comprising two management levels below the Executive Board) and of the entire workforce, as well as the development of the various salary levels over a two-year period. In this respect, the Supervisory Board considers the remuneration levels compared to employees of Deutsche Börse AG, as well as to the overall workforce of Deutsche Börse Group. The Supervisory Board takes the results of this examination into account when setting target remuneration for members of the Executive Board, and thus also ascertains that Executive Board remuneration is appropriate.

Compensation for lapsed remuneration claims against a previous employer

Where a member of the Executive Board has demonstrably and permanently lost claims for remuneration against a previous employer (for example, long-term variable remuneration granted or pension commitments), the Supervisory Board may agree to compensation – in the form of a one-off payment, by granting additional variable remuneration during the first year of the Executive Board service contract, or a one-off contribution to the pension agreement. Any such grants must be disclosed separately in the remuneration report.

Automated share purchase designed to fulfil the plan conditions as well as the share ownership guidelines

For members of the Executive Board, the share purchase agreed upon under the Performance Bonus Plan and the Performance Share Plan, as well as any share purchase from private funds, must be settled by a service provider appointed by Deutsche Börse AG and assigned by the beneficiary; the service provider invests the investment amounts independently, i.e. without any influence from the beneficiary or the company, on behalf of the beneficiary into Deutsche Börse AG shares. The share purchase takes place during the first four trading days (consecutive calendar days) in June every year.

Determining maximum remuneration

The annual remuneration – comprising fixed salary, variable remuneration components and pension expenses – is capped at an aggregate gross amount of €9.5 million (total cap) for each Executive Board member. Ancillary benefits are not included in this amount. Although these are subject to fluctuation, no extraordinary fluctuations are expected and therefore it is not necessary to include them in the total cap. In the interest of shareholders, the company will continue to provide competitive incentives for good personal performance and the company's long-term sustainable success to Executive Board members, whilst preventing any unintended excesses which might otherwise be possible.

Maximum remuneration adjustment as of the 2020 financial year

In future, not only the annual remuneration – comprising fixed salary, variable remuneration components and pension expenses – but also ancillary benefits will be subject to the cap of the total remuneration at an aggregate gross amount of €9.5 million (total cap).

Change of control

If an Executive Board member is asked to stand down within six months of a change of control, he or she is entitled to a severance payment equal to two total annual remuneration payments or the value of the residual term of his or her contract of service, where this is less than two years. This entitlement may be increased to 150 per cent of the severance payment. If an Executive Board member resigns within six months of the change of control taking effect because his or her position as a member of the Executive Board is negatively impacted to a significant degree as a result of the change of control, the Supervisory Board may decide at its discretion whether to grant a severance payment in the above-mentioned amount. In the case of a change of control, all current performance periods shall end on the day on which the contract of service is terminated. The corresponding performance shares will be settled early.

Change of control adjustments as of the 2020 financial year

The provision for a change of control and a resulting severance payment are cancelled without substitution.

Term of Executive Board service contracts

The term of service contracts for Executive Board members depends on the duration of appointment. Generally, a multi-year term of office is envisaged, taking the provisions on flexible age limit into consideration (see the ⊡ "Flexible age limit and term of office" section). The Supervisory Board thus considers the threshold as per section 84 of the AktG, particularly the maximum term of office of five years. In accordance with recommendation B.3 of the GCGC 2020, the term for first-time appointments should not exceed three years. Service contracts do not provide for ordinary termination, in accordance with German public-company law, whereby the right to terminate without notice, for good cause, remains unaffected. The service contract is also terminated early in the event of the appointment being terminated early, unless specificaly agreed otherwise.

Post-contractual non-compete clause

A post-contractual non-compete clause applies to members of Deutsche Börse AG's Executive Board. This means that the Executive Board members in question are contractually prohibited from acting for a competing company, or from undertaking competing activities, for one year following the end of their service. Compensation of 75 per cent of the member's final fixed remuneration and 75 per cent of his or her final cash bonus is payable during the non-compete period. Pension agreement benefits are offset against the compensation. In addition, 50 per cent of other earnings are deducted if these – together with the compensation – exceed the Executive Board member's final remuneration. The company may waive the post-contractual non-compete clause before the Executive Board member's contract of service ends.

> **Adjustments to the post-contractual non-compete clause from the 2020 financial year onwards**
> Going forward, any severance payments will also be offset against compensation, in addition to pension agreement benefits.

Sideline activities

Additional appointments assumed, or sideline activities entered into, by individual members of the Executive Board, require the approval of the full Executive Board and the Chairman of the Supervisory Board or, in certain cases, of the full Supervisory Board (which has delegated granting such approval to the Nomination Committee). If a member of the Executive Board receives any remuneration for an office performed at an affiliate of Deutsche Börse AG, this remuneration is offset against the Executive Board member's entitlement to remuneration from Deutsche Börse AG.

> **Recovery or reduction of variable remuneration (clawback) from the 2020 financial year onwards**
> By virtue of the service contract for Executive Board members, in events of serious misconduct, the Supervisory Board is entitled to demand repayment of variable remuneration under the Performance Bonus Plan or the Performance Share Plan, in full or in part, or to reduce variable remuneration not yet disbursed accordingly (compliance clawback). Any such clawback shall be limited to the calendar year during which the reason has occurred. The Supervisory Board shall be entitled to asset a clawback claim even after an Executive Board member has left the company, for a period of up to two years following termination of the service contract. Any claims for damages remain unaffected by the assertion of any clawback of variable remuneration.

Remuneration system for the Supervisory Board

Remuneration for the Supervisory Board is a fixed remuneration only, plus an attendance fee for meetings, in accordance with suggestion G.18 sentence 1 of the GCGC 2020. The members of the Supervisory Board receive fixed annual remuneration of €70,000. In accordance with section 5.4.6 (1) sentence 2 of the GCGC 2017 (recommendation G.17 of the GCGC 2020), remuneration is increased for the Chairman of the Supervisory Board and for his or her deputy, as well as for chairs and members of committees. The remuneration for the Chairman of the Supervisory Board amounts to €170,000; the remuneration for the Deputy Chairman to €105,000. Members of Supervisory Board committees receive additional fixed annual remuneration of €30,000 for each committee position they hold. The relevant amount for members of the Audit Committee is €35,000. The remuneration paid to committee chairs is €40,000, or €60,000 in the case of the Chairman of the Audit Committee. If a Supervisory Board member belongs to several Supervisory Board committees, only their work on a maximum of two committees (the two most highly remunerated ones) is remunerated. Supervisory Board members who only hold office for part of the financial year receive one-twelfth of the fixed annual remuneration and, if applicable, of the remuneration payable for their membership of committees, for each month or part-month in which they are members. The remuneration for any financial year is due and payable as a one-off payment after the General Meeting that accepts the consolidated financial statements for the relevant financial year or decides on their approval.

Members of the Supervisory Board or a Supervisory Board committee receive an attendance fee of €1,000 for each Board or committee meeting that they attend in person, either as a member or as a guest. Where two or more meetings are held on the same day or on consecutive days, the attendance fee is only paid once.

The Supervisory Board examines, on a regular basis, whether its members' remuneration is appropriate, given their tasks and the situation of the company. For this purpose, the Supervisory Board shall conduct a horizontal market comparison, and may seek the advice of an independent external expert. Depending upon the result of the comparative analysis and the Supervisory Board's assessment of this result, the Supervisory Board may, jointly with the Executive Board, submit a proposal to the Annual General Meeting for adjustments to Supervisory Board remuneration. Irrespective of such a proposal the Annual General Meeting passes a resolution on the remuneration of Supervisory Board members (including the underlying remuneration system) every four years at the latest; the relevant resolution may also confirm the current remuneration.

The structure of Supervisory Board remuneration, providing for fixed remuneration only, strengthens the Board's independence and provides for a counterbalance to the structure of Executive Board remuneration, which is mainly variable and aligned with Deutsche Börse AG's growth strategy. Supervisory Board remuneration therefore contributes to the implementation of the business strategy, and thus promotes Deutsche Börse AG's long-term development.

Planned adjustments to Supervisory Board remuneration from the 2020 financial year onwards

The Supervisory Board has carried out a horizontal comparison of the existing components of Supervisory Board remuneration; this exercise was prepared by the Nomination Committee and the Supervisory Board was supported in its examination by an independent external expert.

Based on this market comparison, the Supervisory Board and the Executive Board resolved to propose to the ordinary Annual General Meeting of Deutsche Börse AG on 19 May 2020 that individual components of Supervisory Board remuneration be adjusted by way of amendments to the Articles of Association. Based on the proposed adjustments, members of the Supervisory Board will in future receive fixed annual remuneration of €85,000. The remuneration for the Chairman of the Supervisory Board is proposed to be raised to €220,000; the remuneration for the Deputy Chairman to €125,000. The additional remuneration for the Chairman of the Audit Committee is proposed to be raised to €75,000. The additional remuneration for chairs of the other committees, as well as for membership in all committees, is set to remain unchanged. The remaining rules governing remuneration for members of Deutsche Börse AG's Supervisory Board will also remain unchanged.

The Supervisory Board believes that the structure of Supervisory Board remuneration, providing for fixed remuneration only (plus attendance fees) already provides for a sensible counterbalance to the growth-oriented Executive Board remuneration, and thus contributes to the sustainable long-term development of Deutsche Börse AG. Fundamentally, remuneration for the Supervisory Board has been unchanged since 2012. The proposed amendments duly account for the further increasing importance of the Supervisory Board's supervision and advisory duties, in the context of rising complexity of Deutsche Börse Group's business activities.

Remuneration report for the Executive Board and the Supervisory Board

Remuneration report for the Executive Board

Loans to Executive Board members

The company did not grant any loans or advances to members of the Executive Board during financial year 2019, and there are no loans or advances from previous years to members of the Executive Board.

Payments to former members of the Executive Board

Former members of the Executive Board or their surviving dependants received payments of €9.7 million in the year under review (2018: €4.4 million). The actuarial present value of the pension obligations as at the reporting date was €84.8 million (31 December 2018: €67.5 million).

Benefits in connection with the termination of Executive Board appointments

The former Deputy CEO, Mr Preuss, has resigned from his appointment as at 31 October 2018. His service contract ended on 31 May 2019. For the remaining term of his service contract in 2019 (1 January until 31 May 2019), he received the following remuneration:

- Fixed remuneration: €333,300
- Performance bonus: €584,500
- Performance shares (full year 2019): 6,473
- Ancillary benefits: €14,400

With regard to Mr Preuss, the company has decided to waive the post-contractual non-compete clause.

Remuneration of former CEO Carsten Kengeter

The former Chief Executive Officer, Carsten Kengeter, who stepped down with effect from 31 December 2017, participated in the Co-Performance Investment Plan (CPIP) that was resolved by the Supervisory Board in 2015. In December 2015, during the investment period provided for in the CPIP, he used private funds to invest €4,500,000 in Deutsche Börse AG shares (investment shares). In return for his acquisition of the investment shares, Mr Kengeter was granted 68,987 co-performance shares in the company. The performance period for the co-performance shares commenced on 1 January 2015 and ended on 31 December 2019. Given that Mr Kengeter only worked for Deutsche Börse AG for three years of the relevant five-year performance period in accordance with the CPIP, the initial number of co-performance shares was reduced to 41,392. Co-performance shares are basically subject to the same financial criteria as for performance shares, which are explained in the section "Principles governing the PSP and assessing target achievement for performance shares". Thus the performance of the co-performance shares is measured on the basis of (i) Deutsche Börse AG's net income growth and (ii) the ratio of the change in TSR for Deutsche Börse shares to that for the companies included in the STOXX® Europe 600 Financials index. The equivalent of performance shares is due for disbursement in three stages: Mr Kengeter received the first advance payment of €2.1 million on 31 March 2019, with the second advance payment due on 31 March 2020 and the final disbursement on 31 March 2021. Based on a pro-rata entitlement of 60 per cent (i.e. three-fifths) for Mr Kengeter's term of office, less than the first advance payment disbursed on 31 March 2019, the company has recognised a provision amounting to €11.0 million.

10,014 performance shares were retrospectively granted to Mr Kengeter for the period from 1 April to 31 December 2018, given his entitlement for performance shares without deduction.

Prior to Mr Kengeter's resignation in 2017, no agreement had been concluded with him for the implementation of the overall cap of an aggregate gross remuneration of €9.5 million, as outlined in the "Caps on the total amount of remuneration" section.

Amount of Executive Board remuneration

The following tables contain the figures for the individual Executive Board remuneration components mentioned above for financial years 2019 and 2018. The remuneration awarded to each Executive Board member in accordance with section 4.2.5 (3) of the German Corporate Governance Code is shown in the "Benefits granted" and "Benefits received" tables. The information disclosed in accordance with section 314 of the HGB is shown in the "Benefits received" tables.

Retirement benefits

	Pensionable income	Replacement rate		Present value/defined benefit obligation		Pension expense	
	2019 € thous.	as at 31 Dec 2019 %	as at 31 Dec 2018 %	as at 31 Dec 2019 € thous.	as at 31 Dec 2018 € thous.	2019 € thous.	2018 € thous.
Defined benefit system							
Thomas Book	500.0	50.0	45.0	6,992.8	4,829.0	384.9	356.1 [1]
Total	**500.0**	**50.0**	**45.0**	**6,992.8**	**4,829.0**	**384.9**	**356.1**
Defined contribution system							
Theodor Weimer	1,000.0	40.0	40.0	957.3	560.8	466.2	677.8
Christoph Böhm	500.0	48.0	48.0	513.3	114.1	419.6	147.9
Stephan Leithner	500.0	48.0	48.0	643.7	256.5	406.1	295.2
Gregor Pottmeyer	500.0	48.0	48.0	4,162.4	3,517.8	297.3	300.1
Hauke Stars	500.0	40.0	40.0	2,312.6	1,918.2	274.4	269.6
Total	**3,000.0**	**224.0**	**224.0**	**8,589.3**	**6,367.4**	**1,863.6**	**1,690.6**

1) Until 30 June 2018, Thomas Book was remunerated by Eurex Frankfurt AG. Since 1 July 2018, Deutsche Börse AG pays out the total amount of Mr Book's remuneration. Thus, Deutsche Börse AG contributes €178,100 to retirement provisions for Thomas Book

2019 total expense for share-based payments
(Prior-year figures in brackets)

	Expense recognised (total) € thous.	Carrying amount as at the reporting date (total) € thous.
Theodor Weimer	1,553.6	2,141,8
	(588.3)	(588.3)
Christoph Böhm	287.9	330.2
	(42.2)	(42.2)
Thomas Book	396.9	513.9
	(116.9)	(116.9)
Stephan Leithner	430.3	557.0
	(126.7)	(126.7)
Gregor Pottmeyer	2,191.4	4,055.8
	(1,200.7)	(1,864.4)
Hauke Stars	2,021.8	3,742.1
	(1,107.9)	(1,720.3)
Andreas Preuss[1)]	–	–
	(4,789.7)	(5,620.9)
Jeffrey Tessler[2)]	–	–
	(3,801.7)	(4,461.4)
Total	**6,881.9**	**11,340.8**
	(11,774.1)	**(14,541.1)**

1) Member of the Executive Board until 31 October 2018; expense recognised / carrying amount as at the reporting date relate to the full financial year 2018
2) Member of the Executive Board until 30 June 2018; expense recognised / carrying amount as at the reporting date relate to the full financial year 2018

Number of phantom shares

		Number of phantom shares on the grant date	Adjustments of number of phantom shares since the grant date	Number of phantom shares as at 31 Dec. 2019
Theodor Weimer	Tranche 2019	11,998	5,602	17,600
	Tranche 2018	13,353	14,812	28,165
	Total 2018 to 2019 tranches			**45,765**
Christoph Böhm	Tranche 2019	5,168	2,414	7,582
	Tranche 2018	959	991	1,950
	Total 2018 to 2019 tranches			**9,532**
Thomas Book	Tranche 2019	4,769	2,221	6,990
	Tranche 2018	2,654	2,743	5,397
	Total 2018 to 2019 tranches			**12,388**
Stephan Leithner	Tranche 2019	5,168	2,414	7,582
	Tranche 2018	2,876	2,972	5,848
	Total 2018 to 2019 tranches			**13,430**
Gregor Pottmeyer	Tranche 2019	5,168	2,414	7,582
	Tranche 2018	5,752	5,944	11,696
	Tranche 2017	7,464	7,548	15,012
	Tranche 2016	7,148	8,063	15,211
	Total 2016 to 2019 tranches			**49,501**
Hauke Stars	Tranche 2019	4,769	2,226	6,995
	Tranche 2018	5,307	5,484	10,791
	Tranche 2017	6,887	6,965	13,852
	Tranche 2016	6,595	7,439	14,034
	Total 2016 to 2019 tranches			**45,672**
	Total 2016 to 2019 tranches			**176,288**

Benefits granted (part 1)

	Theodor Weimer (CEO)				Dr Christoph Böhm (CIO/COO)			
	2019 € thous.	2019 (min) € thous.	2019 (max) € thous.	2018 € thous.	2019 € thous.	2019 (min) € thous.	2019 (max) € thous.	2018 € thous.
Fixed remuneration	1,500.0	1,500.0	1,500.0	1,500.0	720.0	720.0	720.0	120.0
Ancillary benefits	26.8	26.8	26.8	22.9	67.1	67.1	67.1	11.4
Total	**1,526.8**	**1,526.8**	**1,526.8**	**1,522.9**	**787.1**	**787.1**	**787.1**	**131.4**
One-year variable remuneration Cash component of performance bonus (50%)	1,100.0	0.0	2,200.0	1,100.0	560.0	0.0	186.6	93.3
Multi-year variable remuneration	2,400.0	0.0	n/a	2,400.0	1,120.0	0.0	n/a	186.6
Share component performance bonus (50%, 3-year holding period)[1]	1,100.0	0.0	n/a	1,100.0	560.0	0.0	n/a	93.3
Performance shares (5-year term)[2]	1,300.0	0.0	n/a	1,300.0	560.0	0.0	n/a	93.3
Total	**5,026.8**	**1,526.8**	**n/a**	**5,022.9**	**2,467.1**	**787.1**	**n/a**	**411.3**
Pension expense	466.2	466.2	466.2	677.8	419.6	419.6	419.6	147.9
Total remuneration	**5,493.0**	**1,993.0**	**9,500.0**[3]	**5,700.7**	**2,886.7**	**1,206.7**	**9,500.0**[3]	**559.2**

Benefits granted (part 2)

	Thomas Book				Stephan Leithner			
	2019 € thous.	2019 (min) € thous.	2019 (max) € thous.	2018 € thous.	2019 € thous.	2019 (min) € thous.	2019 (max) € thous.	2018 € thous.
Fixed remuneration	650.0	650.0	650.0	325.0	720.0	720.0	720.0	360.0
Ancillary benefits	31.6	31.6	31.6	15.7[4]	19.3	19.3	19.3	5.7
Total	**681.6**	**681.6**	**681.6**	**340.7**	**739.3**	**739.3**	**739.3**	**365.7**
One-year variable remuneration Cash component of performance bonus (50%)	516.7	0.0	516.6	258.3	560.0	0.0	560.0	280.0
Multi-year variable remuneration	1,033.4	0.0	n/a	516.6	1,120.0	0.0	n/a	560.0
Share component performance bonus (50%, 3-year holding period)[1]	516.7	0.0	n/a	258.3	560.0	0.0	n/a	280.0
Performance shares (5-year term)[2]	516.7	0.0	n/a	258.3	560.0	0.0	n/a	280.0
Total	**2,231.7**	**681.6**	**n/a**	**1,115.6**	**2,419.3**	**739.3**	**n/a**	**1,205.7**
Pension expense	384.9	384.9	384.9	356.1	406.1	406.1	406.1	295.2
Total remuneration	**2,616.6**	**1,066.5**	**9,500.0**[3]	**1,471.7**	**2,825.4**	**1,145.4**	**9,500.0**[3]	**1,500.9**

Benefits granted (part 3)

	Gregor Pottmeyer (CFO)				Hauke Stars (Director of Labour Relations)			
	2019 € thous.	2019 (min) € thous.	2019 (max) € thous.	2018 € thous.	2019 € thous.	2019 (min) € thous.	2019 (max) € thous.	2018 € thous.
Fixed remuneration	720.0	720.0	720.0	720.0	650.0	650.0	650.0	650.0
Ancillary benefits	34.5	34.5	34.5	29.2	30.1	30.1	30.1	24.9
Total	**754.5**	**754.5**	**754.5**	**749.2**	**680.1**	**680.1**	**680.1**	**674.9**
One-year variable remuneration Cash component of performance bonus (50%)	560.0	0.0	1,120.0	560.0	516.7	0.0	1,033.4	516.7
Multi-year variable remuneration	1,120.0	0.0	n/a	1,120.0	1,033.4	0.0	n/a	1,033.4
Share component performance bonus (50%, 3-year holding period)[1]	560.0	0.0	n/a	560.0	516.7	0.0	n/a	516.7
Performance shares (5-year term)[2]	560.0	0.0	n/a	560.0	516.7	0.0	n/a	516.7
Total	**2,434.5**	**754.5**	**n/a**	**2,429.2**	**2,230.2**	**680.1**	**n/a**	**2,225.0**
Pension expense	297.3	297.3	297.3	300.1	274.4	274.4	274.4	269.6
Total remuneration	**2,731.8**	**1,051.8**	**9,500.0**[3]	**2,729.3**	**2,504.6**	**954.5**	**9,500.0**[3]	**2,494.6**

1) The level of target achievement is capped at 200 per cent. No cap on the share price performance – therefore, no maximum can be stated (n.m.). For more information, please refer to the “Combined corporate governance statement and corporate governance report” section

2) The target achievement rates for net income and total shareholder return, and for the maximum number of performance shares are all capped at 250 per cent. No cap on the share price performance – therefore, no maximum can be stated for the individual remuneration components (no max.). For more information, please refer to the “Combined corporate governance statement and corporate governance report” section

3) The total remuneration (excluding ancillary benefits) is capped at €9.5 million

4) Until 30 June 2018, Thomas Book was remunerated by Eurex Frankfurt AG. Since 1 July 2018, Deutsche Börse AG pays out the total amount of Mr Book’s remuneration. Thus, Deutsche Börse AG contributes €178,100 to retirement provisions for Thomas Book

Benefits received (part 1)

	Theodor Weimer (CEO)		Dr Christoph Böhm (CIO/COO)		Thomas Book	
	2019 € thous.	2018 € thous.	2019 € thous.	2018 € thous.	2019 € thous.	2018 € thous.
Fixed remuneration	1,500.0	1,500.0	720.0	120.0	650.0	325.0
Ancillary benefits[1)]	26.8	22.9	67.1	11.4	31.6	15.7
Total	**1,526.8**	**1,522.9**	**787.1**	**131.4**	**681.6**	**340.7**
One-year variable remuneration Cash component of performance bonus (50%)	1,515.4	2,117.5	823.5	155.6	693.7	439.2
Multi-year variable remuneration	1,515.4	2,117.5	823.5	155.6	693.7	439.2
Share component performance bonus (50%, 3-year holding period)	1,515.4	2,117.5	823.5	155.6	693.7	439.2
Performance shares (5-year term)	–	–	–	–	–	–
Total	**4,557.6**	**5,757.9**	**2,434.1**	**442.6**	**2,069.0**	**1,219.1**
Pension expense	466.2	677.8	419.6	147.9	384.9	356.1 [4)]
Total remuneration (German Corporate Governance Code)[2)]	**5,023.8**	**6,435.7**	**2,853.7**	**590.5**	**2,453.9**	**1,575.2**
Plus performance shares	1,300.0	1,300.0	560.0	93.3	516.7	258.3
Less variable share component	–	–	–	–	–	–
Less pension expense	– 466.2	– 677.8	– 419.6	– 147.9	– 384.9	– 356.1
Total remuneration (section 314 of the HGB)	**5,857.6**	**7,057.9**	**2,994.1**	**535.9**	**2,585.7**	**1,477.4**
Number of phantom shares (no-par value share)[3)]	11,998	13,353	5,168	959	4,769	2,654

Benefits received (part 2)

	Stephan Leithner		Gregor Pottmeyer (CFO)		Hauke Stars (Director of Labour Relations)		Total[5]	
	2019 € thous.	2018 € thous.	2019 € thous.	2018 € thous.	2019 € thous.	2018 € thous.	2019 € thous.	2018 € thous.
Fixed remuneration	720.0	360.0	720.0	720.0	650.0	650.0	4,960.0	3,675.0
Ancillary benefits[1]	19.3	5.7	34.5	29.2	30.1	24.9	209.4	109.8
Total	**739.3**	**365.7**	**754.5**	**749.2**	**680.1**	**674.9**	**5,169.4**	**3,784.8**
One-year variable remuneration Cash component of performance bonus (50%)	771.5	476.0	732.2	856.8	643.4	759.5	5,179.7	4,804.6
Multi-year variable remuneration	771.5	476.0	732.2	856.8	643.4	759.5	5,179.7	4,804.6
Share component performance bonus (50%, 3-year holding period)	771.5	476.0	732.2	856.8	643.4	759.5	5,179.7	4,804.6
Performance shares (5-year term)	–	–	–	–	–	–	–	–
Total	**2,282.3**	**1,317.7**	**2,218.9**	**2,462.8**	**1,966.9**	**2,193.9**	**15,528.8**	**13,394.0**
Pension expense	406.1	295.2	297.3	300.1	274.4	269.6	2,248.5	2,046.7
Total remuneration (German Corporate Governance Code)[2]	**2,688.4**	**1,612.9**	**2,516.2**	**2,762.9**	**2,241.3**	**2,463.5**	**17,777.3**	**15,440.7**
Plus performance shares	560.0	280.0	560.0	560.0	516.7	516.7	4,013.4	3,008.3
Less variable share component	–	–	–	–	–	–	–	–
Less pension expense	– 406.1	– 295.2	– 297.3	– 300.1	– 274.4	– 269.6	– 2,248.5	– 2,046.7
Total remuneration (section 314 of the HGB)	**2,842.3**	**1,597.7**	**2,778.9**	**3,022.8**	**2,483.6**	**2,710.6**	**19,542.2**	**16,402.3**
Number of phantom shares (no-par value share)[3]	5,168	2,876	5,168	5,752	4,769	5,307	37,040	30,901

1) Ancillary benefits (other benefits) comprise salary components such as taxable contributions towards private pensions, company car arrangements, travel arrangements, and expenses for tax and legal advice
2) The total remuneration (excluding ancillary benefits) is capped at €9.5 million
3) The number of prospective performance shares for the performance period determined at the 2019 grant date is calculated by dividing the target amount by the average share price (Xetra® closing price) for Deutsche Börse shares in December 2018 (€108.36)
4) Until 30 June 2018, Thomas Book was remunerated by Eurex Frankfurt AG. Since 1 July 2018, Deutsche Börse AG pays out the total amount of Mr Book's remuneration. Thus, Deutsche Börse AG contributes €178,100 to retirement provisions for Thomas Book
5) Prior-year figures were adjusted due to Messrs Andreas Preuss and Jeffrey Tessler leaving the company; thus, they do not match the figures published in the previous year

Remuneration report for the Supervisory Board

The members of the Supervisory Board receive fixed annual remuneration of €70,000. The remuneration for the Chairman of the Supervisory Board amounts to €170,000; the remuneration for the Deputy Chairman to €105,000. Members of Supervisory Board committees receive additional fixed annual remuneration of €30,000 for each committee position they hold. The relevant amount for members of the Audit Committee is €35 thousand. The remuneration paid to committee chairs is €40 thousand, or €60 thousand in the case of the Chairman of the Audit Committee. If a Supervisory Board member belongs to several Supervisory Board committees, only their work on a maximum of two committees (the two most highly remunerated ones) is remunerated. Supervisory Board members who only hold office for part of the financial year receive one-twelfth of the fixed annual remuneration and, if applicable, of the remuneration payable for their membership of committees, for each month or part-month in which they are members.

Members of the Supervisory Board or a Supervisory Board committee receive an attendance fee of €1 thousand for each Board or committee meeting that they attend in person, either as a member or as a guest. Where two or more meetings are held on the same day or on consecutive days, the attendance fee is only paid once.

Remuneration paid to members of the Supervisory Board for advisory and agency services
No agreements for advisory and agency services had been entered into in the reporting period with members of the Supervisory Board, or with companies that employ members of the Supervisory Board of Deutsche Börse AG or in which Supervisory Board members hold an interest.

Supervisory Board remuneration[1)]

	2019	2018	2019[4)] € thous.	2018[4)] € thous.
Joachim Faber (Chairman)	full year	full year	257.0	260.0
Nadine Absenger	full year	16 May – 31 Dec	114.0	95.0
Ann-Kristin Achleitner[2)]	1 Jan - 8 May	full year	43.7	118.5
Markus Beck	full year	15 Aug - 31 Dec	147.0	55.8
Richard Berliand[2)]	1 Jan - 8 May	full year	62.3	168.3
Karl-Heinz Flöther	full year	full year	146.0	146.0
Marion Fornoff	–	1 Jan – 15 Aug	–	84.2
Hans-Peter Gabe	–	1 Jan – 15 Aug	–	86.8
Craig Heimark	–	1 Jan – 16 May	–	45.7
Martin Jetter	full year	16 May – 31 Dec	143.7	89.7
Susann Just-Marx	full year	15 Aug - 31 Dec	139.0	53.2
Achim Karle	full year	28 Aug - 31 Dec	138.0	53.2
Cornelis Johannes Nicolaas Kruijssen	full year	15 Aug - 31 Dec	139.0	53.2
Barbara Lambert	full year	16 May – 31 Dec	171.0	114.7
Monica Mächler	–	1 Jan – 16 May	–	61.3
Joachim Nagel	full year	16 May – 31 Dec	156.0	102.7
Florian Rodeit	–	16 May – 15 Aug	–	45.3
Carsten Schäfer	full year	28 Aug - 31 Dec	138.0	53.2
Erhard Schipporeit	–	1 Jan – 16 May	–	71.7
Charles G. T. Stonehill[3)]	8 May – 31 Dec	–	69.7	–
Clara-Christina Streit[3)]	8 May – 31 Dec	–	68.7	–
Jutta Stuhlfauth (Deputy Chairwoman)	full year	full year	181.0	172.7
Gerd Tausendfreund	full year	16 May – 31 Dec	107.0	72.7
Johannes Witt	–	1 Jan – 16 May	–	61.3
Amy Yip	full year	full year	129.5	118.5
Total			**2,350.6**	**2,183.7**

1) The recipient of the remuneration is determined individually by the members of the Supervisory Board
2) Left the Supervisory Board on 8 May 2019
3) Elected to the Supervisory Board on 8 May 2019
4) Remuneration including individual attendance fee

Combined corporate governance statement and corporate governance report

Deutsche Börse Group assigns great importance to the principles of good corporate governance and control. In this statement, we report on corporate governance at Deutsche Börse AG in accordance with section 3.10 of the Deutscher Corporate Governance Kodex (the "Code", German Corporate Governance Code). Moreover, this statement contains the corporate governance statement pursuant to sections 289f and 315d of the Handelsgesetzbuch (HGB, German Commercial Code).

Declaration of Compliance pursuant to section 161 of the Aktiengesetz (AktG, German Stock Corporation Act)

On 10 December 2019, the Executive Board and Supervisory Board of Deutsche Börse AG issued the following Declaration of Conformity:

"Declaration by the Executive Board and the Supervisory Board of Deutsche Börse AG regarding the German Corporate Governance Code in accordance with section 161 of the German Stock Corporation Act

The following Declaration of Conformity refers to the current version of the German Corporate Governance Code (GCGC) of 7 February 2017 as published in the Federal Gazette on 24 April 2017.

The Executive Board and the Supervisory Board of Deutsche Börse AG declare that the recommendations of the GCGC have been met almost completely and will be met with only few deviations. For details, please see below:

1. Agreement of severance payment caps when concluding Executive Board contracts (no. 4.2.3 (4) GCGC)

Severance payment caps agreed upon in all current contracts with the members of the Executive Board complied and will continue to comply with recommendation no. 4.2.3 (4) GCGC. As in the past, however, the Supervisory Board reserves the right to deviate from no. 4.2.3 (4) GCGC in the future under certain circumstances. The Supervisory Board is of the opinion that a deviation may become necessary in extraordinary cases.

2. Caps on total amount of remuneration (no. 4.2.3 (2) (sentence 6) GCGC) and disclosure in the remuneration report (no. 4.2.5 (3) GCGC)

No. 4.2.3 (2) (sentence 6) GCGC recommends that the amount of management compensation shall be capped, both as regards variable components and in the aggregate. Deutsche Börse AG deviated and will deviate from this recommendation.

The annual remuneration, comprising fixed and variable remuneration components and pension benefits, is capped at EUR 9.5 million (total cap) for each member of the Executive Board. Ancillary benefits are so far not included in this amount. Although these are subject to fluctuation, no extraordinary fluctuations are expected and therefore it is not necessary to include them in the total cap. However, it is envisaged to include also the ancillary benefits in the calculation of the total cap of € 9.5 million in the future when renewing existing service contracts or entering into new service contracts with Executive Board members.

The long-term variable remuneration components under the remuneration system are share-based. Even though a cap is provided in relation to the number of shares granted, no dedicated cap is foreseen on the maximum achievable bonus amount as there is no cap on share price performance. Extraordinary developments are however sufficiently reflected in the total cap.

No. 4.2.5 (3) (subitem 1) GCGC recommends, inter alia, presenting the maximum achievable remuneration for variable remuneration components in the remuneration report. As there will be no dedicated cap in relation to the share-based variable remuneration components, the maximum achievable remuneration cannot be presented as recommended in no. 4.2.5 (3) (subitem 1) GCGC.

3. Composition of the Nomination Committee (no. 5.3.3 GCGC)

No. 5.3.3 GCGC recommends that the Supervisory Board forms a Nomination Committee composed exclusively of shareholder representatives. In accordance with Section 4 b of the German Stock Exchange Act the Nomination Committee also assists the Supervisory Board of Deutsche Börse AG in selecting candidates for the Executive Board. As in particular this task shall not exclusively be performed by the shareholder representatives on the Supervisory Board the Nomination Committee also includes employee representatives. However, it will be ensured that the nominees proposed to the Annual General Meeting for the election as members of the Supervisory Board are determined solely by the shareholder representatives on the Committee."

The annual Declaration of Conformity pursuant to section 161 of the AktG, as well as the Declarations of Conformity for the past five years, are available on our website www.deutsche-boerse.com/declcompliance.

Disclosures on suggestions of the Code
Deutsche Börse AG also largely complies with the suggestions of the Code and deviates only regarding the following aspects:

In accordance with section 4.1.3 sentence 3 of the Code, employees shall be given the opportunity to report, in a protected manner, suspected breaches of the law within the company; third parties should also be given this opportunity. Deutsche Börse AG has implemented a whistleblowing system for its employees in accordance with the recommendation in section 4.1.3 sentence 3 of the Code. This whistleblowing system is also open to external service providers. However, Deutsche Börse deviates otherwise from the suggestion of also giving third parties the opportunity of reporting such suspicions mainly given the fact that, as far as Deutsche Börse is concerned, other such third parties are regular market participants who have other options at their disposal for reporting suspicions without being bound by fiduciary duties under employment law.

In accordance with section 4.2.3 (2) (sentence 9) of the Code, early disbursements of multiple-year, variable remuneration components should not be permitted. While Deutsche Börse AG adheres to this suggestion in principle, it reserves the right to deviate in extraordinary circumstances, e.g. in the event of an Executive Board member's inability to work, disease or death. The company also reserves the right to diverge from this procedure in other extraordinary cases, such as change-of-control events.

Information on corporate governance practices

Conduct policies
Deutsche Börse Group's global orientation means that binding policies and standards of conduct must apply at each of the Group's locations around the world. Specifically, the main objectives of these principles for collaboration are to ensure responsibility, respect and mutual esteem. The Group also adheres to these principles when implementing its business model. Communications with clients, investors, employees and the general public are based on timely information and transparency. In

addition to focusing on generating profits, Deutsche Börse Group's business is managed sustainably in accordance with recognised standards of social responsibility.

Code of business conduct for employees

Acting responsibly means having values that are shared by all employees throughout the Group. In 2017, Deutsche Börse AG's Executive Board adopted an extended code of business conduct. This document, which is applicable throughout the Group, defines the foundations of key ethical and legal standards, including – but not limited to – the following topics:

- Confidentiality and the handling of sensitive information
- Conflicts of interest
- Personal account dealing, as well as the prevention of insider dealing and market manipulation
- Company resources and assets
- Combat of bribery and corruption
- Risk management
- Whistleblowers
- Environmental awareness
- Equal opportunities and protection against undesirable behaviour

The code of business conduct applies to members of the Executive Board, all other executives and all employees of Deutsche Börse Group. In addition to specifying concrete rules, the code of business conduct provides general guidance as to how employees can contribute to implementing the defined values in their everyday working life. The goal of the code of business conduct is to provide guidance on working together in the company on a day-to-day basis, to help resolve any conflicts and to resolve ethical and legal challenges. All newly hired employees receive the code of business conduct as part of their employment contract documentation. The code of business conduct is an integral part of the relationship between employer and employees at Deutsche Börse Group. Breaches may lead to disciplinary action. The document is available on www.deutsche-boerse.com > Sustainability > Set an example > Employees > Guiding principles.

Code of conduct for suppliers and service providers

Deutsche Börse Group not only requires its management and staff to adhere to high standards – it demands the same from its suppliers and service providers. The code of conduct for suppliers and service providers requires them to respect human rights and employee rights and comply with minimum standards. Implementing a resolution of the Executive Board, the code of conduct for suppliers was amended in 2016 to include the requirements set out in the UK Modern Slavery Act, applicable to all corporations conducting business in the United Kingdom. Most suppliers have signed up to these conditions; all other key suppliers have made voluntary commitments, which correspond to, or in fact, exceed Deutsche Börse Group's standards. Service providers and suppliers must sign this code or enter into an equivalent voluntary commitment before they can do business with Deutsche Börse Group. The code of conduct for suppliers is reviewed regularly in the light of current developments and amended if necessary. It is available on Deutsche Börse Group's website www.deutsche-boerse.com > Sustainability > Set an example > Procurement management.

Values

Deutsche Börse Group's business activities are based on the legal frameworks and ethical standards of the different countries in which it operates. A key way in which the Group underscores the values it considers important is by joining initiatives and organisations that advocate generally accepted ethical standards. Relevant memberships are as follows:

United Nations Global Compact www.unglobalcompact.org: this voluntary business initiative established by the United Nations aims to achieve a more sustainable and more equitable global economy. At the heart of the compact are ten principles covering the areas of human rights, labour, environment protection and anti-corruption. Deutsche Börse Group has submitted annual communications on progress (COPs) on its implementation of the UN Global Compact since 2009.

Diversity Charter www.diversity-charter.com: as a signatory to the Diversity Charter, the company has committed to acknowledging, respecting and promoting the diversity of its workforce, customers and business associates – irrespective of their age, gender, disability, race, religion, nationality, ethnic background, sexual orientation or identity.

International Labour Organization www.ilo.org: this UN agency is the international organisation responsible for drawing up and overseeing international labour standards; it brings together representatives of governments, employees and employers to promote the joint development of policies and programmes. Deutsche Börse Group has signed up to the ILO's labour standards and hence has agreed to abide by them.

Frankfurt Declaration www.deutsche-boerse.com/frankfurt-declaration:the Frankfurt Declaration demonstrates the signatories' intention to define the framework conditions for sustainable finance and to put concrete initiatives in place in the Frankfurt financial centre. These are directed towards the identification of innovative business areas and the responsible handling of risks, among other things. The potential of sustainable finance infrastructures must therefore be fully encouraged in order to support positive economic and social development founded on the unconditional protection of the natural basis of life.

For further information on sustainability at Deutsche Börse Group, please see the chapter „Combined non-financial statement” or go to www.deutsche-boerse.com > Sustainability.

Sector-specific policies

Deutsche Börse Group's pivotal role in the financial sector requires that it handles information – and especially sensitive data and facts – responsibly. A number of rules are in force throughout the Group to ensure that employees comply with this. These cover both legal requirements and special policies applicable to the relevant industry segments, such as the whistleblowing system and risk and control management policies.

Whistleblowing system

Deutsche Börse Group's whistleblowing system gives employees and external service providers an opportunity to report non-compliant behaviour. The Group has engaged the auditing and consulting company Deloitte to act as an external ombudsman and receive any such information submitted by phone or e-mail. Whistleblowers' identities are not revealed to Deutsche Börse Group.

Risk and control management policies

Functioning control systems are an important part of stable business processes. Deutsche Börse Group's enterprise-wide control systems are embedded in an overarching framework. This comprises, among other things, the legal requirements, the recommendations of the German Corporate Governance Code, international regulations and recommendations and other company-specific policies. The executives responsible for the different elements of the control system are in close contact with each other and with the Executive Board, and report regularly to the Supervisory Board or its committees. Equally, the Group has an enterprise-wide risk management system that covers and provides mandatory rules for functions, processes and responsibilities. Details of the internal control system and risk management at Deutsche Börse Group can be found in the “Internal management” and “Risk report” sections.

Working practices of the Executive Board and the Supervisory Board

An important fundamental principle of the German Stock Corporation Act is the dual board system – which assigns separate, independent responsibilities to the Executive Board and the Supervisory Board. These responsibilities and their implementation at Deutsche Börse AG are set out in detail in the following paragraphs.

Both boards perform their duties in the interests of the company and with the aim of achieving a sustainable increase in value. Their actions are based on the principle of responsible corporate governance. Therefore, Deutsche Börse AG's Executive Board and Supervisory Board work closely together in a spirit of mutual trust, with the Executive Board providing the Supervisory Board with comprehensive information on the company's and the Group's position and the course of business in a regular and timely manner. In addition, the Executive Board regularly informs the Supervisory Board concerning all issues relating to corporate planning, the risk situation, risk management, compliance and the company's control systems. The strategic orientation of the company is examined in detail and agreed upon with the Supervisory Board. Implementation of the relevant measures is discussed at regular intervals. The Chief Executive Officer reports to the Supervisory Board without undue delay, orally or in writing, on matters that are of special importance to the company.

In addition, the CEO keeps the Chairman of the Supervisory Board continuously informed of the current developments affecting the company's business, significant transactions, upcoming decisions and the long-term outlook and discusses these issues with him. The Supervisory Board may also request reports from the Executive Board at any time, especially on matters and business transactions at Deutsche Börse AG and subsidiaries that have a significant impact on Deutsche Börse AG's position.

Deutsche Börse AG's Executive Board

The Executive Board manages Deutsche Börse AG and Deutsche Börse Group; it had six members during the reporting period. The main duties of the Executive Board include defining the Group's corporate goals and strategic orientation, managing and monitoring the operating units, as well as establishing and monitoring an efficient risk management system. The Executive Board is responsible for preparing the consolidated and annual financial statements of Deutsche Börse AG, as well as for producing financial information during the course of the year. In addition, it must ensure the company's compliance with legal requirements and official regulations.

The members of the Executive Board are jointly responsible for all aspects of management. Irrespective of this collective responsibility, the individual members manage the company's business areas assigned to them in the Executive Board's schedule of responsibilities independently and are personally responsible for them. In addition to the business areas, the functional areas of responsibility are that of the Chief Executive Officer (CEO), the Chief Financial Officer (CFO) and the Chief Information Officer/ Chief Operating Officer (CIO/COO). The business areas cover the operating business units, such as the company's cash market activities, the derivatives business, securities settlement and custody and the market data business. Details can be found in the "Overview of Deutsche Börse Group – Organisational structure" section.

Further details of the Executive Board's work are set out in the bylaws that the Supervisory Board has resolved for the Executive Board. Among other things, these list issues that are reserved for the entire Executive Board, special measures requiring the approval of the Supervisory Board, other procedural details and the arrangements for passing resolutions. The Executive Board holds regular meetings; these are convened by the CEO, who coordinates the Executive Board's work. Any Executive Board member can require a meeting to be convened. In accordance with its bylaws, the entire Executive Board normally takes decisions on the basis of resolutions passed by a simple majority of the members voting on them in each case. If a vote is tied, the CEO has the casting vote.

More information on the Executive Board, its composition, members' individual appointments and biographies can be found at www.deutsche-boerse.com/execboard.

Deutsche Börse AG's Supervisory Board

The Supervisory Board supervises and advises the Executive Board in its management of the company. It supports the Executive Board in significant business decisions and provides assistance on strategically important issues. The Supervisory Board has specified measures requiring its approval in the bylaws for the Executive Board. In addition, the Supervisory Board is responsible for appointing the members of the Executive Board, deciding on their total remuneration, examining Deutsche Börse AG's consolidated and annual financial statements and the combined management report including the combined non-financial statement. Details of the Supervisory Board's work during the 2019 financial year can be found in the report of the Supervisory Board.

The Supervisory Board consisted of 16 members, and has parity co-determination, which means it consists of an equal number of shareholder representatives and employee representatives in line with the German Mitbestimmungsgesetz (MitbestG, German Co-determination Act). The term of office for shareholder and employee representatives on the current Supervisory Board ends at the Annual General Meeting in 2021.

The Supervisory Board holds at least six regular meetings every year. In addition, extraordinary meetings are held as required. The committees also hold regular meetings. Unless mandatory statutory provisions or the Articles of Associations call for a different procedure, the Supervisory Board passes its resolutions by a simple majority. If a vote is tied, the Chairman has the casting vote. In addition, the Supervisory Board regularly reviews the structure, size, composition and performance of the work of the Executive and Supervisory Boards as well as the effectiveness of its own work, and discusses potential areas for improvement and resolves suitable measures, where necessary.

Supervisory Board committees

The Supervisory Board's goal in establishing committees is to improve the efficiency of its work by examining complex matters in smaller groups that prepare them for the plenary meeting of the Supervisory Board. Additionally, the Supervisory Board has delegated individual decision-making powers to the committees, to the extent that this is legally permissible. The Supervisory Board had seven committees at the beginning of the reporting period. The Chairman Selection Committee was established for a limited period of time for the purpose of preparing the new election of the Supervisory Board Chair after the Annual General Meeting 2020. For details on the committees, please refer to the "Supervisory Board committees during 2019: composition and responsibilities" tables. Their individual responsibilities are outlined in the Supervisory Board's bylaws. The committees' rules of procedure correspond to those for the plenary meeting of the Supervisory Board. Details of the current duties and members of the individual committees can be found online, at www.deutsche-boerse.com/supervboard > Committees.

The chairmen of the individual committees report to the plenary meeting about the subjects addressed and resolutions passed in the committee meetings. Information on the Supervisory Board's concrete work and meetings during the reporting period can be found in the report of the Supervisory Board.

More information on the Supervisory Board and its committees, the individual members and their appointments and biographies, can be found at:
www.deutsche-boerse.com/supervboard.

Supervisory Board committees during 2019: composition and responsibilities

Audit Committee

Members	Composition / Responsibilities
▪ Barbara Lambert (Chairperson) ▪ Nadine Absenger[1)] ▪ Markus Beck[1)] ▪ Karl-Heinz Flöther ▪ Joachim Nagel ▪ Jutta Stuhlfauth[1)]	**Composition** ▪ At least four members who are elected by the Supervisory Board ▪ Prerequisites for the chair of the committee: the person concerned must be independent, and must have specialist knowledge and experience of applying accounting principles as well as internal control and risk management processes (financial expert) ▪ Persons who cannot chair the committee: the Chairman of the Supervisory Board; former members of the company's Executive Board whose appointment ended less than two years ago **Responsibilities** ▪ Deals with issues relating to the preparation of the annual budget and financial topics, particularly capital management ▪ Deals with issues relating to the adequacy and effectiveness of the company's control systems – in particular, to risk management, compliance and internal audit ▪ Audit reports ▪ Deals with accounting issues, including oversight of the accounting and reporting process ▪ Half-yearly financial reports, plus any quarterly financial reports, if applicable ▪ Examines the annual financial statements, the consolidated financial statements and the combined management report (including the combined non-financial statement), discusses the audit report with the external auditors and prepares the Supervisory Board's resolutions adopting the annual financial statements and approving the consolidated financial statements, as well as the resolution on the Executive Board's proposal on the appropriation of the unappropriated surplus ▪ Prepares the Supervisory Board's recommendation to the Annual General Meeting on the election of the external auditors of the annual financial statements, the consolidated financial statements and the half-yearly financial report (to the extent that the latter is audited or reviewed by external auditors) and makes corresponding recommendations to the Supervisory Board ▪ Deals with the required independence of the external auditor ▪ Deals with non-audit services rendered by the external auditor ▪ Issues the engagement letter to the external auditor of the annual financial statements and the consolidated financial statements – including, in particular, the review or audit of half-yearly financial reports, and determines focal areas of the audit and the audit fee ▪ Prepares the Supervisory Board's resolution approving the statement on the German Corporate Governance Code pursuant to section 161 of the AktG and the corporate governance statement in accordance with section 289f of the HGB

1) Employee representative

Nomination Committee

Members	Composition
▪ Joachim Faber (Chairman) ▪ Markus Beck[1] ▪ Richard Berliand (until 8 May 2019) ▪ Martin Jetter ▪ Jutta Stuhlfauth[1] ▪ Gerd Tausendfreund[1] ▪ Amy Yip (since 8 May 2019)	▪ Chaired by the Chairman of the Supervisory Board ▪ At least five other members who are elected by the Supervisory Board **Responsibilities** ▪ Proposes suitable candidates to the Supervisory Board for inclusion in the Supervisory Board's election proposal to the Annual General Meeting (the proposal is being submitted by shareholder representatives) ▪ Other tasks and duties set forth in section 4b (5) of the BörsG ▪ Deals with issues relating to the contracts of service for Executive Board members and, in particular, to the structure and amount of their remuneration ▪ Addresses succession planning for the Executive Board ▪ Approves appointments of members of Deutsche Börse AG's Executive Board to other executive boards, supervisory boards, advisory boards and similar boards, as well as honorary appointments and sideline activities, including any exemptions from the approval requirement ▪ Approves the grant or revocation of general powers of attorney ▪ Approves cases in which the Executive Board grants employees retirement pensions or other individually negotiated retirement benefits, or proposes to enter into employer/works council agreements establishing pension plans

1) Employee representative

Risk Committee

Members	Composition
▪ Joachim Nagel (Chairman) ▪ Susann Just-Marx[1] ▪ Cornelis Kruijssen[1] ▪ Barbara Lambert	▪ At least four members who are elected by the Supervisory Board **Responsibilities** ▪ Reviews the risk management framework, including the overall risk strategy, risk appetite and the risk roadmap ▪ Takes note of and reviews the periodic risk management and compliance reports ▪ Oversees monitoring of the Group's operational, financial and business risks ▪ Discusses the annual reports on significant risks and the risk management systems at regulated Group entities, to the extent legally permissible

1) Employee representative

Strategy Committee

Members	Composition
▪ Joachim Faber (Chairman) ▪ Ann-Kristin Achleitner (until 8 May 2019) ▪ Susann Just-Marx[1] ▪ Achim Karle[1] ▪ Carsten Schäfer[1] ▪ Charles Stonehill (since 8 May 2019) ▪ Clara-Christina Streit (since 8 May 2019) ▪ Amy Yip (until 8 May 2019)	▪ Chaired by the Chairman of the Supervisory Board ▪ At least five other members who are elected by the Supervisory Board **Responsibilities** ▪ Advises the Executive Board on matters of strategic importance to the company and its affiliates ▪ Addresses fundamental strategic and business issues, as well as projects important to Deutsche Börse Group

1) Employee representative

Technology Committee

Members	Composition
▪ Martin Jetter (Chairman since 8 May 2019) ▪ Richard Berliand (Chairman until 8 May 2019) ▪ Karl-Heinz Flöther ▪ Achim Karle[1)] ▪ Cornelis Kruijssen[1)] ▪ Carsten Schäfer[1)] ▪ Amy Yip (since 8 May 2019)	▪ At least four members who are elected by the Supervisory Board **Responsibilities** ▪ Supports the Supervisory Board in meeting its supervisory duties with respect to the information technology used to execute the Group's business strategy and with respect to information security ▪ Advises on IT strategy and architecture ▪ Oversees monitoring of technological innovations, the provision of IT services, the technical performance and stability of IT systems, operational IT risks, and information security services and -risks

1) Employee representative

Chairman's Committee

Members	Composition
▪ Joachim Faber (Chairman) ▪ Nadine Absenger[1)] ▪ Richard Berliand (until 8 May 2019) ▪ Martin Jetter (since 8 May 2019) ▪ Jutta Stuhlfauth[1)]	▪ Chaired by the Chairman of the Supervisory Board ▪ Deputy Chairperson of the Supervisory Board as well as one shareholder representative and one employee representative each who are elected by the Supervisory Board **Responsibilities** ▪ Time-sensitive affairs

1) Employee representative

Mediation Committee

Members	Composition
▪ Joachim Faber (Chairman) ▪ Karl-Heinz Flöther (since 8 May 2019) ▪ Martin Jetter (until 8 May 2019) ▪ Susann Just-Marx[1)] ▪ Jutta Stuhlfauth[1)]	▪ Chaired by the Chairman of the Supervisory Board ▪ Deputy Chairperson of the Supervisory Board as well as one shareholder representative and one employee representative each **Responsibilities** ▪ Tasks and duties pursuant to section 27 (3) of the MitbestG

1) Employee representative

Chairman Selection Committee (temporary committee since 19 September 2019)

Members	Composition
▪ Barbara Lambert (Chairperson) ▪ Markus Beck[1)] ▪ Joachim Faber ▪ Jutta Stuhlfauth[1)] ▪ Gerd Tausendfreund[1)] ▪ Amy Yip	▪ As determined by the Supervisory Board **Responsibilities** ▪ Prepares the new election of the Supervisory Board Chair -, in particular, recommends candidates to be elected by the Supervisory Board

1) Employee representative

Targets for composition and qualification requirements of the Supervisory Board

In accordance with section 5.4.1 of the Code, the Supervisory Board has adopted a catalogue of specific targets concerning its composition that, above all, should serve as a basis for the future nomination of its members. This catalogue comprises qualification requirements as well as diversity targets. Furthermore, members shall have sufficient time, as well as the personal integrity and suitability of character, to exercise their office. In addition, half of the shareholder representatives on the Supervisory Board shall be independent.

Qualification requirements
Given their knowledge, skills and professional experience, members of the Supervisory Board shall have the ability to perform the duties of a supervisory board member in a company with international business activities. The Supervisory Board has determined individual (basic) as well as general qualification requirements. Basic requirements are derived from the business model, the concrete targets, as well as from specific regulations applicable to Deutsche Börse Group.

Individual (basic) qualification requirements
Ideally, each Supervisory Board member holds the following basic qualifications:

- Understanding of commercial issues
- Analytical and strategic skills
- Understanding of the corporate governance system
- Knowledge of the financial services sector
- Understanding of Deutsche Börse AG's activities
- Understanding of Deutsche Börse Group's structure
- Understanding of the member's own position and responsibilities

General qualification requirements
The general qualifications refer to the Supervisory Board in its entirety. At least two of its members should have profound knowledge, especially concerning the following topics:

- Business models of exchanges and the capital markets
- Accounting, finance, audit
- Risk management and compliance
- Information technology and security, digitalisation
- Clearing, settlement and custody business
- Regulatory requirements

The current composition of the Supervisory Board fulfils these criteria concerning the qualification of its members.

Supervisory Board members' general qualification requirements

	Business models of exchanges and the capital markets	Accounting, finance, audit	Risk management and compliance	Information technology and security, digitalisation	Clearing, settlement and custody business	Regulatory requirements
Joachim Faber (Chairman)	+	+	+			+
Karl-Heinz Flöther		+		+		
Martin Jetter			+	+		+
Barbara Lambert		+	+	+		+
Joachim Nagel	+		+	+	+	+
Charles Stonehill	+		+		+	
Clara-Christina Streit	+	+			+	+
Amy Yip	+	+			+	

Independence

In accordance with section 5.4.2 of the Code, the Supervisory Board shall be comprised of what it considers to be an appropriate number of independent members. Supervisory Board members are no longer to be considered independent in the meaning of section 5.4.2 of the Code, particularly if they have a personal or business relationship with the company, its governing bodies, a controlling shareholder or an entity affiliated with the controlling shareholder that may cause a substantial (and not merely temporary) conflict of interest. The Supervisory Board has resolved that at least half of its members who are shareholder representatives are to be independent in this sense. The Supervisory Board regards all of its shareholder representatives as being independent.

Diversity concept for the Executive Board and the Supervisory Board

The diversity concept for the Executive Board and the Supervisory Board, as adopted by the Supervisory Board in accordance with section 289f (2) no. 6 of the HGB, has the objective of ensuring a wide range of perspectives and experience through the composition of both bodies. The concept is implemented within the scope of appointing new Executive Board members or regarding nominations for election of new Supervisory Board members.

Flexible age limit and term of office

The Supervisory Board considers the flexible age limit stipulated in the bylaws (generally 70 years) when nominating candidates for election by the Annual General Meeting. Furthermore, the Supervisory Board's bylaws provide for a general limitation to members' maximum term of office to twelve years, which the Supervisory Board shall also consider in its nominations of candidates to the Annual General Meeting.

The flexible age limit for members of the Executive Board provides for the term of office to expire at the end of the month during which a member reaches the age of 60 years. From the month during which an Executive Board member has reached the age of 60, re-appointment is permitted for a period of one year in each case, provided that the last term of office shall expire at the end of the month during which the Executive Board member reaches the age of 65. When appointing members of the Executive Board, the Supervisory Board pursues the objective of achieving an optimal composition of the Executive Board from the company's perspective. In this context, experience and industry knowledge, as well as professional and personal qualifications, play a major role. Depending on the Executive Board position to be filled, it is not just the scope and depth of skills that is decisive, but also whether the specific skills are up to date. The flexible age limit has been deliberately worded to preserve the Supervisory Board's flexibility in taking decisions on appointments.

At present, no Executive Board member has passed the age limit of 65 years. However, the Supervisory Board agreed to prolong Theodor Weimer’s term of office as Chairman of Deutsche Börse AG’s Executive Board in the long term, until 31 December 2024. Theodor Weimer will reach the age of 65 in 2024. The main reason for prolonging his term of office is his comprehensive expertise in the financial sector, the professional and personal qualifications he has proven to possess since the beginning of his term of office in 2018, and the special role of the Chairman of the Executive Board. Against this background, the Supervisory Board resolved to extent Mr Weimer’s term of office for a period of more than one year, although he has already reached the age of 60.

Share of women holding management positions
With regard to the Supervisory Board, the legally prescribed gender quota of 30 per cent in accordance with section 96 (2) of the AktG applies. In order to prevent the possible discrimination of either shareholder representatives or employee representatives, and in order to increase the planning security in the relevant election procedures, the shareholder representatives on the Supervisory Board have opposed the overall compliance of the quota in accordance with section 96 (2) (sentence 2) of the AktG. Thus, the minimum proportion of 30 per cent is to be complied with for each gender with regard to the shareholder representatives and the employee representatives. This means that at least two women and two men from each the shareholder representatives and from the employee representatives must be on the Supervisory Board. Currently, there are three women each from the shareholder representatives and from the employee representatives. The legally prescribed gender quota is thus complied with.

Deutsche Börse AG’s Supervisory Board has defined a target quota for women on the Executive Board in accordance with section 111 (5) of the AktG. The first minimum target – 20 per cent of the Executive Board members were to be women – was complied with by the end of the implementation period on 30 June 2017. The quota of women on the Executive Board was 20 per cent at such point in time. Effective 1 July 2017, the Supervisory Board decided to extend the 20 per cent target quota of women on the Executive Board until 31 December 2021. This quota, however, declined due to the increase of the Executive Board to six members as of 1 July 2018, despite the fact that the actual number of women on the Executive Board did not change. The quota of women on the Executive Board is currently 16.7 per cent.

The Supervisory Board intends to comply with the 20 per cent target quota for women on the Executive Board and also intends to further increase the quota for women on the Supervisory Board. This will be taken into account in future personnel decisions.

International profile
The composition of the Executive Board and the Supervisory Board shall reflect the company’s international activities. With Barbara Lambert, Charles Stonehill, Clara-Christina Streit and Amy Yip, there are four shareholder representatives on the Supervisory Board holding non- (or non-exclusive) German citizenship. Cornelis Kruijssen, employee representative on the Supervisory Board, has the Dutch nationality. In addition, many of the members of the Supervisory Board have long-term professional experience in the international field or are working abroad on a permanent basis. The Supervisory Board will therefore continue to meet the objectives concerning its international composition. The same applies to the Executive Board, where Stephan Leithner holds non-German citizenship, and whose members have gained long-standing international working experience as well.

Educational and professional background
The Supervisory Board has set itself the objective of considering an appropriate range of educational and professional backgrounds regarding its own composition, as well as regarding the composition of the Executive Board. The composition of both the Supervisory Board and the Executive Board reflect these objectives. In addition to possessing professional experience in the financial services industry, members of the Executive Board and the Supervisory Board also have a professional background in consultancy, the IT sector, administration and regulation as well as auditing. In terms of academic education, economic and legal degrees prevail, in addition to backgrounds, inter alia, in IT and engineering. Education and professional experience thus also contribute to fulfilling the previously mentioned qualification requirements for Supervisory Board members.

The composition of both Deutsche Börse AG's Supervisory Board and Executive Board is in line with the objectives stated above. Please refer to www.deutsche-boerse.com/supervboard for further information concerning the members of the Supervisory Board and its committees. For further information concerning the members of the Executive Board, please see www.deutsche-boerse.com/execboard.

Preparations for the election of a chairperson as well as shareholder representatives to the Supervisory Board

Joachim Faber, the long-standing Chairman of the Supervisory Board, will depart from the Supervisory Board after the Annual General Meeting on 19 May 2020. The Supervisory Board embarked with the process of finding a suitable successor for Mr Faber as chair of the Supervisory Board – and the necessary election of a new member of the Supervisory Board – at an early stage.

In September 2019, the Supervisory Board established the Chairman Selection Committee for the purpose of preparing the projected election of the Supervisory Board chair. The committee is chaired by Barbara Lambert. After an extensive review of all potential internal and external candidates, the Chairman Selection Committee proposed to the Supervisory Board that Martin Jetter be elected as the new Supervisory Board Chairman. In December 2019, the Supervisory Board acknowledged the proposal of the Chairman Selection Committee, and nominated Martin Jetter as candidate to succeed Mr Faber as chair of the Supervisory Board.

The Supervisory Board's Nomination Committee – whose task it is to propose suitable candidates to the Supervisory Board for recommendation to the Annual General Meeting – has concerned itself with Mr Faber's successor as member of the Supervisory Board. After a careful pre-selection process and several personal candidate interviews, the Nomination Committee resolved in December 2019 to propose to the Supervisory Board that Michael Rüdiger be nominated as candidate to be elected by the Annual General Meeting 2020. When selecting an appropriate candidate, the committee has taken into account the above criteria.

Mr Rüdiger has many years of experience in the financial services industry, on both an national and international level. He acquired his comprehensive expertise regarding capital market topics – among others – in executive positions at Schweizerische Kreditanstalt, UBS (formerly named Schweizerische Bankgesellschaft), Allianz Asset Management and Credit Suisse, where he headed the Central Europe business. Most recently, from 2012 to 2019, Mr Rüdiger served as Chairman of the Board of Management of DekaBank Deutsche Girozentrale. He is a Supervisory Board member of Evonik Industries AG and was a Exchange Council member at both Frankfurter Wertpapierbörse (FWB, the Frankfurt Stock Exchange) and Eurex Deutschland from 2017 to 2020, chairing FWB's Exchange Council since mid-2017.

Training and professional development measures for members of the Supervisory Board

As a matter of principle, Supervisory Board members are responsible for their continuing professional development. Deutsche Börse AG complies with the recommendation of section 5.4.5 (2) of the Code as well as the guidelines of the European Securities and Markets Authority (ESMA) on management bodies of market operators and data reporting services providers, and supports Supervisory Board members in this endeavour – for example, by organising targeted introductory events for new Supervisory Board members, or workshops on selected strategy issues as well as on professional topics (if required). Thus, in addition to one strategy and two technology workshops, the Supervisory Board held workshops on sustainable finance as well as legal and compliance matters. In individual cases, Deutsche Börse AG assumes the costs incurred for third-party training, which are then covered by the qualification programme for Supervisory Board members.

Examination of the effectiveness of Supervisory Board work

Deutsche Börse AG regards regular reviews of the effectiveness of Supervisory Board work – in accordance with section 5.6 of the Code – as a key component of good corporate governance. The 2019 effectiveness examination was supported by an external service provider, and dedicated to the following areas: tasks and composition of the Supervisory Board, co-operation between Supervisory Board members and between the Executive Board and the Supervisory Board, Supervisory Board meetings and Supervisory Board committees. The review yielded positive results, both in terms of overall effectiveness as well as regarding the audited subject areas. Where it identified room for improvement, optimising proposals were discussed by the Supervisory Board and measures for their execution implemented.

Long-term succession planning for the Executive Board

Together with the Executive Board, the Supervisory Board ensures that there is long-term succession planning. Therefore, the Supervisory Board, or its Nomination Committee, regularly – at least once a year – concerns itself with potential Executive Board member candidates. The Chairman of the Executive Board is involved in these considerations, provided that the discussed subject matters do not refer to the succession of his own position. The Supervisory Board prepares an applicant profile for vacant Executive Board positions. The Supervisory Board pays attention to ensure that the knowledge, expertise and experience of all Executive Board members be diverse and well balanced, and adheres to the adopted diversity concept. Moreover, the Supervisory Board ensures it is informed regularly about the succession planning at the first level beneath the Executive Board, and provides advice to the Executive Board in this regard.

Target figures for the proportion of female executives beneath the Executive Board

Deutsche Börse AG's Executive Board has defined target quotas for women on the two management levels beneath the Executive Board, in accordance with section 76 (4) of the AktG, in each case referring to Deutsche Börse AG. By 31 December 2021, the proportion of women holding positions in the first and second management levels beneath the Executive Board is planned to amount to 15 per cent and 20 per cent, respectively. As per 31 December 2019, the share of women holding positions on the first and second management levels beneath the Executive Board at Deutsche Börse AG in Germany was 15 per cent and 18 per cent, respectively.

Moreover, as early as in 2010, the Executive Board had adopted a voluntary commitment to increase the share of women holding middle and upper management positions to 20 per cent by 2020 and of women holding lower management positions to 30 per cent during the same period. The Group maintains this ambition, and has extended the scope of its voluntary commitment, over and above legal requirements. Firstly, the target figures determined in this context relate to Deutsche Börse Group (including subsidiaries) worldwide. Secondly, the definition of management levels/positions was extended to also include heads of teams, for example. On a global level, as at 31 December 2019, these quotas stood at 15 per cent for upper and middle management levels and 27 per cent for lower management positions. For Germany, the quotas were 16 per cent and 22 per cent, respectively.

Shareholder representation, transparent reporting and communication

Shareholders exercise their rights at the Annual General Meeting (AGM). In the spirit of good corporate governance, Deutsche Börse AG aims to make it as easy as possible for shareholders to exercise their shareholder rights. For instance, Deutsche Börse AG shareholders may follow the AGM over the internet and can be represented at the AGM by proxies nominated by Deutsche Börse AG. These proxies exercise voting rights solely in accordance with shareholders' instructions. Additionally, shareholders may exercise their voting rights by post or online. Among other things, the AGM elects the shareholder representatives to the Supervisory Board and resolves on the formal approval of the actions of the Executive Board and the Supervisory Board. It also passes resolutions on the appropriation of the unappropriated surplus, resolves on capitalisation measures and approves intercompany agreements and amendments to Deutsche Börse AG's Articles of Association. Ordinary AGMs – at which the Executive Board and the Supervisory Board give an account for the past financial year – take place once a year.

To maximise transparency and ensure equal access to information, Deutsche Börse AG's corporate communications generally follow the rule that all target groups should receive all relevant information simultaneously. Deutsche Börse AG's financial calendar informs shareholders, analysts, shareholders' associations, the media and interested members of the public of key events such as the date of the AGM, or publication dates for financial performance indicators.

Ad hoc disclosures, information on directors' dealings and voting rights notifications, corporate reports and interim reports, and company news can all be found on Deutsche Börse's website: www.deutsche-boerse.com. Deutsche Börse AG provides information about its consolidated and annual financial statements at an annual press briefing. It also offers conference calls for analysts and investors following the publication of the interim reports. Furthermore, when outlining its strategy and providing information to everyone who is interested, it abides by the principle that all target groups worldwide must be informed at the same time.

Additionally, Deutsche Börse AG submitted a COP for 2019 to the UN Global Compact. Good corporate governance is one of Deutsche Börse Group's core concerns, is why it has complied with the Global Compact's principles for many years. Public records of this have been available since the company officially joined the initiative in 2009: www.deutsche-boerse.com > Sustainability > Our responsibility > UN Global Compact.

Accounting and auditing

Deutsche Börse AG's annual report provides shareholders and interested members of the public with detailed information on Deutsche Börse Group's business performance during the reporting period. Additional information is published in its half-yearly financial report and two quarterly statements. The annual financial statement documents and the annual report are published within 90 days of the end of the financial year (31 December); intra-year financial information (half-yearly financial report and quarterly statements) is made available within 45 days of the end of the relevant quarter or six-month period. Following preparations by the Audit Committee, the consolidated and annual financial statements are discussed by the entire Supervisory Board and with the external auditors, examined, and then approved. The Executive Board discusses the half-yearly report and the quarterly statements for the first and third quarters with the Supervisory Board's Audit Committee prior to their publication. The half-yearly financial report is reviewed by the external auditors. In line with the proposal by the Supervisory Board, the 2019 AGM elected KPMG AG Wirtschaftsprüfungsgesellschaft, Berlin, (KPMG) to audit its 2019 annual and consolidated financial statements and to review its half-yearly financial report in the year under review. KPMG was also instructed to perform a review of the contents of the combined non-financial statement during the 2019 financial year. The lead auditor, Sven-Olaf Leitz, and the deputy lead auditor, Klaus-Ulrich Pfeiffer, have been responsible for the audit since 2018. The Supervisory Board's proposal was based on the recommendation by the Audit Committee. The Audit Committee obtained the necessary statement of independence from KPMG before the election. This states that there are no personal, business, financial or other relationships between the auditor, its governing bodies and audit managers on the one hand, and the company and the members of its Executive and Supervisory Boards on the other, that could give cause to doubt the auditor's independence. The Audit Committee checked that this continued to be the case during the reporting period. It also oversaw the financial reporting process in 2019. The Supervisory Board was informed in a timely manner of the Committee's work and the insights gained; there were no material findings. Information on audit services and fees is provided in note 6 to the consolidated financial statements.

Frankfurt/Main, 2 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
Wirtschaftsprüfer
[German Public Auditor]

gez. Pfeiffer
Wirtschaftsprüfer
[German Public Auditor]