Finance Report *2018*

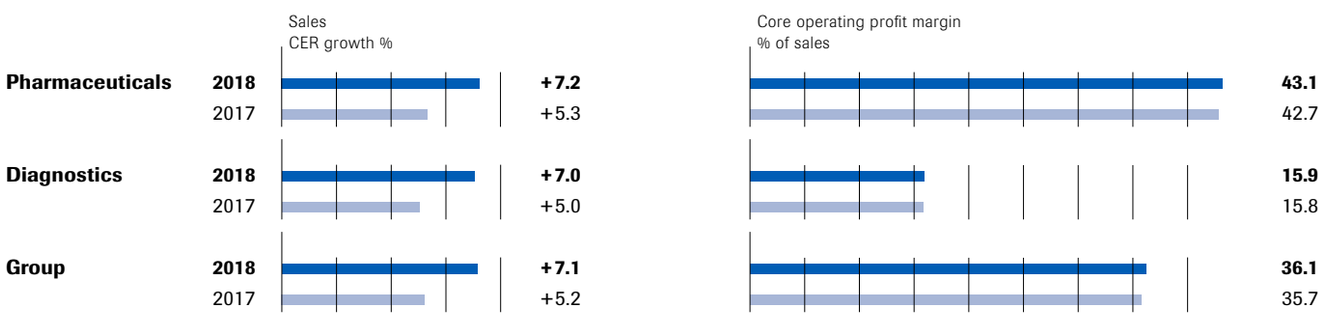
PATIENTS
In cancer, modern care helps where no effective treatments were available previously. Innovative therapies allow this woman on the cover picture to carry on with her life. See back cover for more.

INNOVATION
Advanced analytics enable us to create a wealth of new data insights and opportunities across the entire product lifecycle and R&D value chain to ultimately improve outcomes for patients.

PARTNERS
Roche is expanding its collaborations, combining its own strengths with the unique tools of its partners to elevate personalised healthcare to a new level for many more patients.

Finance in Brief

Key results



	2018 (CHF m)	2017 (CHF m)	% change (CHF)	% change (CER)	% of sales 2018	% of sales 2017
IFRS results						
Sales	56,846	53,299	+7	+7		
Operating profit	14,769	13,003	+14	+15	26.0	24.4
Net income	10,865	8,825	+23	+24	19.1	16.6
Net income attributable to Roche shareholders	10,500	8,633	+22	+23	18.5	16.2
Diluted EPS (CHF)	12.21	10.04	+22	+23		
Dividend per share (CHF)	8.70[1]	8.30	+5			
Core results						
Research and development	11,047	10,392	+6	+6	19.4	19.5
Core operating profit	20,505	19,012	+8	+9	36.1	35.7
Core EPS (CHF)	18.14	15.34	+18	+19		
Free cash flow						
Operating free cash flow	18,741	17,827	+5	+5	33.0	33.4
Free cash flow	14,811	13,420	+10	+11	26.1	25.2

	2018 (CHF m)	2017 (CHF m)	% change (CHF)	% change (CER)
Net debt	(5,652)	(6,963)	–19	–19
Capitalisation	49,136	47,967	+2	+4
– Debt	18,770	18,960	–1	–1
– Equity	30,366	29,007	+5	+6

1) Proposed by the Board of Directors.

CER (Constant Exchange Rates): The percentage changes at constant exchange rates are calculated using simulations by reconsolidating both the 2018 and 2017 results at constant exchange rates (the average rates for the year ended 31 December 2017). For the definition of CER see page 162.

Core results and Core EPS (earnings per share): These exclude non-core items such as global restructuring plans and amortisation and impairment of goodwill and intangible assets. This allows an assessment of both the actual results and the underlying performance of the business. A full income statement for the Group and the operating results of the divisions are shown on both an IFRS and core basis. The core concept is fully described on pages 155–158 and reconciliations between the IFRS and core results are given there.

Free cash flow is used to assess the Group's ability to generate the cash required to conduct and maintain its operations. It also indicates the Group's ability to generate cash to finance dividend payments, repay debt and to undertake merger and acquisition activities. The free cash flow concept is used in the internal management of the business. The free cash flow concept is fully described on pages 158–160 and reconciliations between the IFRS cash flow and free cash flow are given there.

Finance – 2018 in Brief

Roche in 2018

The **Roche Group** reported very strong overall results in 2018. Sales grew by 7% at constant exchange rates (CER). IFRS net income increased by 24% (CER) and core earnings per share increased by 19% (CER). A major driver was the US tax reform and, excluding this, core earnings per share grew by 8%.

Sales

Group sales increased by 7% (CER) to CHF 56.8 billion (7% growth in CHF terms).
Pharmaceuticals sales growth was 7% (CER) due to the new medicines Ocrevus, Perjeta, Tecentriq, Alecensa and Hemlibra. In oncology there was continued growth in the HER2 franchise and Avastin. MabThera/Rituxan sales fell following biosimilar launches in Europe while biosimilar entry in the US was delayed. Immunology sales increased, led by Actemra/RoActemra and Xolair.
Diagnostics sales showed growth of 7% (CER) with the immunodiagnostics business being the major contributor.

Operating results

Core operating profit increased by 9% (CER) to CHF 20.5 billion (8% increase in CHF terms).
Research and development expenditure grew by 6% (CER) to CHF 11.0 billion on a core basis, with focus on the oncology, neuroscience and immunology therapeutic areas. Research and development costs represented 19.4% of Group sales.
IFRS operating results include non-core expenses (pre-tax) of CHF 5.7 billion. The major factors were CHF 3.3 billion for the impairment of goodwill and intangible assets, notably CHF 1.8 billion relating to the InterMune acquisition.

Non-operating results

Financing costs (IFRS) decreased by 8% to CHF 0.8 billion due to the base effect of 2017 debt redemption losses.
Income tax expenses (IFRS) decreased by 3% at CER to CHF 3.3 billion. The effective core tax rate for 2018 was 19.7%, with the US tax reform decreasing this rate by more than 7 percentage points.

Net income

IFRS net income increased by 24% at CER to CHF 10.9 billion (23% increase in CHF terms).
Core earnings per share increased by 19% at CER (+18% in CHF terms).

Cash flows

Operating free cash flow increased to CHF 18.7 billion. The underlying cash generation in both divisions led to an increase of operating free cash flow of 5% at CER and in CHF terms.
Free cash flow increased by 11% at CER (+10% in CHF terms) to CHF 14.8 billion, driven by the higher operating free cash flow and lower income tax payments.

Financial position

Net working capital decreased by 10% (CER), driven by lower inventories in the Pharmaceuticals Division.
Net debt decreased to CHF 5.7 billion, the free cash flow more than covered the dividends and payments for mergers and acquisitions. Net debt as a percentage of total assets was 7.2%.
Credit ratings strong: Moody's at Aa3 and Standard & Poor's at AA.

Shareholder return

Dividends. A proposal will be made to increase dividends by 5% to CHF 8.70 per share. This will represent the 32nd consecutive year of dividend growth and will result in a pay-out ratio of 48.0%, subject to AGM approval.
Total Shareholder Return (TSR) was 2% representing the combined performance of share and non-voting equity security.

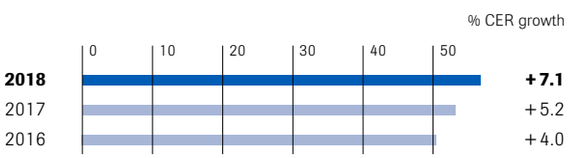
Roche Group

Roche Holding Ltd, Basel

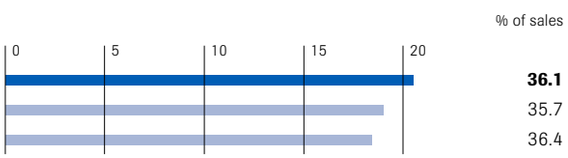
Financial Review

Roche Group results

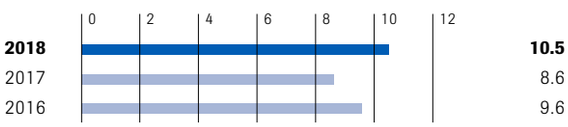
Sales in billions of CHF



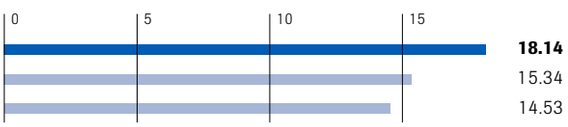
Core operating profit in billions of CHF



Net income attributable to Roche shareholders in billions of CHF



Core EPS in CHF



In 2018 the Roche Group reported sales growth of 7% at constant exchange rates (CER) and core operating profit growth of 9%. IFRS net income increased by 24% and Core EPS increased by 19% due to the growth of the business and the impact of the 2017 US tax reform. The sales growth was driven by the new Pharmaceuticals medicines, which more than compensated for the growing impacts of biosimilar competition in Europe, and by the immunodiagnostics business in the Diagnostics Division. The Group improved its operating profitability through various productivity initiatives, while supporting the launch of new products and continuing its investments in research and development. Operating free cash flow was CHF 18.7 billion, an increase of 5%, due to higher cash generated by the business partly offset by higher capital expenditure.

Divisional operating results for 2018

	Pharmaceuticals (CHF m)	Diagnostics (CHF m)	Corporate (CHF m)	Group (CHF m)
Sales	43,967	12,879	–	56,846
Core operating profit	18,942	2,046	(483)	20,505
– margin, % of sales	43.1	15.9	–	36.1
Operating profit	14,788	617	(636)	14,769
– margin, % of sales	33.6	4.8	–	26.0
Operating free cash flow	17,851	1,416	(526)	18,741
– margin, % of sales	40.6	11.0	–	33.0

Divisional operating results – Development of results compared to 2017

	Pharmaceuticals	Diagnostics	Corporate	Group
Sales				
– % increase at CER	+7	+7	–	+7
Core operating profit				
– % increase at CER	+8	+9	–4	+9
– margin: percentage point increase	+0.5	+0.3	–	+0.5
Operating profit				
– % increase at CER	+13	+115	+16	+15
– margin: percentage point increase	+1.6	+2.6	–	+1.7
Operating free cash flow				
– % increase at CER	+6	–8	–3	+5
– margin: percentage point increase	–0.3	–1.8	–	–0.5

Sales in the Pharmaceuticals Division were CHF 44.0 billion (2017: 41.2 billion). New products were the major growth driver, with Ocrevus, Perjeta, Tecentriq, Alecensa and Hemlibra together contributing an additional CHF 2.9 billion (CER) of new sales. Ocrevus in particular continued its strong performance with total sales now reaching CHF 2.4 billion due to continuing growth in the US and launches in most major European markets in 2018. Perjeta sales were CHF 2.8 billion, an increase of 27%, with higher demand in early-stage adjuvant settings in the US. New product sales more than compensated for the initial impacts of biosimilar entry in Europe and Japan, where sales of MabThera/Rituxan and Herceptin fell by CHF 1.3 billion (CER) during 2018. The first biosimilar versions of MabThera/Rituxan were anticipated to come to market in the US in mid- to end-2018. The first biosimilar versions of MabThera/Rituxan, Herceptin and Avastin are now anticipated to come to market in the US in the second half of 2019. Avastin sales were 3% higher mainly due to growth in China. Sales growth in immunology was 8%, with sales of Actemra/RoActemra, Xolair and Esbriet all increasing by over 10%. Lucentis sales grew 18% in the US with increased market share across all indications. Competitive pressure in the US led to a 36% fall in Tarceva sales.

The Diagnostics Division reported sales of CHF 12.9 billion, an increase of 7% at CER. The major growth area was Centralised and Point of Care Solutions, which represented more than half of the division's sales and which grew by 8%, led by the immunodiagnostics business. Molecular Diagnostics sales increased by 5%, with growth from the cobas Liat system, blood screening and virology businesses, while Diabetes Care sales increased by 2%.

IFRS operating profit increased by 13% in the Pharmaceuticals Division and by 115% in the Diagnostics Division, with the results of both divisions impacted by impairments of goodwill and intangible assets in both the current year and the comparative period. The 2018 results include CHF 3.3 billion for the impairment of goodwill and intangible assets, with the largest items being CHF 1.8 billion relating to the InterMune acquisition. Impairments of goodwill and intangible assets in 2017 were CHF 3.5 billion. Amortisation of intangible assets was CHF 1.3 billion and there were CHF 0.9 billion of expenses from global restructuring plans.

The Pharmaceuticals Division's core operating profit increased by 8% at CER, which was above the 7% sales increase. Cost of sales increased by 10%, due to volume-driven growth in manufacturing costs and increased royalty expenses, notably for Ocrevus. Marketing and distribution grew by 4% due to product launches including Ocrevus and Tecentriq. Research and development costs grew by 6%, especially in the oncology, neuroscience and immunology therapeutic areas. Operating profitability benefited from various productivity initiatives. IFRS operating profit grew ahead of the core operating profit due to lower restructuring charges and also due to lower amortisation charges for intangible assets. Operating free cash flow grew with the underlying business partly offset by higher capital expenditure, notably at Chugai.

In the Diagnostics Division core operating profit increased by 9% at CER, which was also above the increase in sales of 7%. Cost of sales grew by 6% due to increased sales volumes partially offset by favourable instrument and reagent mixes. Research and development increased by 7% due to higher spending on high/mid-volume systems in Centralised and Point of Care Solutions and development of digital clinical decision support products. IFRS operating profit grew by more than core operating profit as a result of lower amortisation charges for intangible assets. Operating free cash flow was 11% of sales, but decreased due to the higher net working capital.

The Group's operating free cash flow was CHF 18.7 billion, an increase of 5% at CER, due to the high cash generation of the business, partly offset by higher capital expenditure. The free cash flow was CHF 14.8 billion, an increase of CHF 1.4 billion, due to the higher operating free cash flow and lower income tax payments.

Financing costs were 8% lower on an IFRS basis at CHF 0.8 billion due to the base impact of the losses on debt redemption in the prior year. Income tax expenses were lower, with the Group's effective core tax rate at 19.7% compared to 26.6% in 2017. This was largely due to the impact from the US tax reform which decreased the effective core tax rate by more than 7 percentage points.

Net income increased by 24% at CER on an IFRS basis and by 20% on a core basis, driven in both cases by the operating results and the impact of the US tax reform. Excluding the impact of the US tax reform Core EPS increased by 8%.

The results expressed in Swiss francs were negatively impacted by the appreciation of the Swiss franc against the US dollar and the Brazilian real, partly offset by the depreciation of the Swiss franc against the euro. The net impact on the results expressed in Swiss francs compared to constant exchange rates was negligible on sales and a 1 percentage point impact on core operating profit and on Core EPS.

Income statement

	2018 (CHF m)	2017 (CHF m)	% change (CHF)	% change (CER)
IFRS results				
Sales	56,846	53,299	+7	+7
Royalties and other operating income	2,651	2,447	+8	+9
Revenue	**59,497**	**55,746**	**+7**	**+7**
Cost of sales	(17,269)	(18,179)	–5	–5
Marketing and distribution	(10,109)	(9,847)	+3	+3
Research and development	(12,092)	(11,292)	+7	+7
General and administration	(5,258)	(3,425)	+54	+54
Operating profit	**14,769**	**13,003**	**+14**	**+15**
Financing costs	(770)	(839)	–8	–8
Other financial income (expense)	149	84	+77	+73
Profit before taxes	**14,148**	**12,248**	**+16**	**+17**
Income taxes	(3,283)	(3,423)	–4	–3
Net income	**10,865**	**8,825**	**+23**	**+24**
Attributable to				
– Roche shareholders	10,500	8,633	+22	+23
– Non-controlling interests	365	192	+90	+88
EPS – Basic (CHF)	12.29	10.12	+21	+23
EPS – Diluted (CHF)	12.21	10.04	+22	+23
Core results[1]				
Sales	56,846	53,299	+7	+7
Royalties and other operating income	2,635	2,447	+8	+8
Revenue	**59,481**	**55,746**	**+7**	**+7**
Cost of sales	(15,464)	(14,366)	+8	+8
Marketing and distribution	(9,905)	(9,512)	+4	+4
Research and development	(11,047)	(10,392)	+6	+6
General and administration	(2,560)	(2,464)	+4	+4
Operating profit	**20,505**	**19,012**	**+8**	**+9**
Financing costs	(744)	(819)	–9	–9
Other financial income (expense)	149	75	+99	+94
Profit before taxes	**19,910**	**18,268**	**+9**	**+10**
Income taxes	(3,929)	(4,864)	–19	–18
Net income	**15,981**	**13,404**	**+19**	**+20**
Attributable to				
– Roche shareholders	15,593	13,192	+18	+19
– Non-controlling interests	388	212	+83	+82
Core EPS – Basic (CHF)	18.25	15.47	+18	+19
Core EPS – Diluted (CHF)	18.14	15.34	+18	+19

1) See pages 155–158 for the definition of core results and Core EPS.

Mergers and acquisitions

The Group has implemented the amendments to IFRS 3 'Business Combinations' issued in October 2018. The amendments further clarify the definition of a business. The effect of the amendments is particularly applicable for many of the acquisitions carried out by the Roche Group, since the value in the acquired companies often consists of the rights to a single product or technology. From 2018 such transactions will be accounted for as asset acquisitions rather than as business combinations. As a result the acquisition of Ignyta has been reassessed and accounted for as an asset acquisition in the 2018 Annual Financial Statements rather than as a business combination as disclosed in the 2018 Interim Financial Statements. Further details are given in Note 6 to the Annual Financial Statements.

Business combinations. On 5 April 2018 the Pharmaceuticals Division acquired a 100% controlling interest in Flatiron Health, Inc. ('Flatiron Health') for CHF 1.6 billion. Flatiron Health is a market leader in the curation and development of real-world evidence for cancer research as well as oncology-specific electronic health record software.

Asset acquisitions. On 8 February 2018 the Pharmaceuticals Division acquired a 100% controlling interest in Ignyta, Inc. ('Ignyta') for CHF 1.8 billion. With the acquisition, the Group obtained rights to Ignyta's lead product candidate, entrectinib, an orally bioavailable, CNS-active tyrosine kinase inhibitor for patients who have tumours that harbour ROS1 or NTRK fusions. The Pharmaceuticals Division also completed the acquisitions of Tusk Therapeutics Ltd and Jecure Therapeutics, Inc. for a total cash consideration of CHF 0.2 billion.

Other transactions. On 18 June 2018 the Group entered into a merger agreement with Foundation Medicine, Inc. ('FMI') to acquire the outstanding shares of FMI's common stock not already owned by the Group at a price of USD 137.00 per share in cash. FMI has been a fully consolidated subsidiary of the Group since 2015. On 31 July 2018 the transaction closed and FMI became a 100% owned subsidiary of the Group. The cash consideration for the purchase of all public shares, including shares issuable on FMI's outstanding stock incentive plans and payment of related fees and expenses, amounted to CHF 2.3 billion. These amounts have been recorded to equity as a change in ownership interest in subsidiaries.

Further details are given in Notes 6 and 30 to the Annual Financial Statements.

Global restructuring plans

During 2018 the Group continued with the implementation of various resourcing flexibility plans in its Pharmaceuticals Division to address various future challenges including biosimilar competition. The focus areas of the plans include biologics manufacturing, commercial operations and product development/strategy. The Group also continued with the implementation of several major global restructuring plans initiated in prior years, notably the strategic realignment of the Pharmaceuticals Division's manufacturing network, and programmes to address long-term strategy in the Diagnostics Division.

Global restructuring plans: costs incurred in 2018 in millions of CHF

	Diagnostics[1]	Site consolidation[2]	Other plans[3]	Total
Global restructuring costs				
– Employee-related costs	105	153	202	460
– Site closure costs	49	173	5	227
– Divestment of products and businesses	8	0	0	8
– Other reorganisation expenses	73	1	138	212
Total global restructuring costs	**235**	**327**	**345**	**907**
Additional costs				
– Impairment of goodwill	0	0	0	0
– Impairment of intangible assets	0	0	0	0
– Legal and environmental cases	7	12	0	19
Total costs	**242**	**339**	**345**	**926**

1) Includes strategy plans in the Diagnostics Division.
2) Includes the Pharmaceuticals Division's strategic realignment of its manufacturing network and resourcing flexibility in biologics manufacturing network.
3) Includes plans for outsourcing of IT and other functions to shared service centres and external providers and for resourcing flexibility in the Pharmaceuticals Division's commercial operations and global product development/strategy organisations.

Diagnostics Division. Strategy plans in the Diagnostics Division incurred costs of CHF 87 million mainly for employee-related matters. Costs of CHF 36 million are included for the divestment of subsidiary in Germany and costs related to a reorganisation in the Molecular Diagnostics business were CHF 27 million. Spending on other plans within the division was CHF 92 million.

Site consolidation. Costs from the Pharmaceuticals Division's strategic realignment of its manufacturing network were CHF 117 million and mainly related to the exit from the manufacturing site at Clarecastle, Ireland. The resourcing flexibility plan in the biologics manufacturing network incurred costs of CHF 215 million, mainly relating to asset impairment and severance costs. Integration costs following the Ignyta acquisition were CHF 46 million.

Other global restructuring plans. Resourcing flexibility initiatives in the Pharmaceuticals Division incurred costs of CHF 146 million, mainly employee-related. The other major item was CHF 111 million for plans for outsourcing to shared service centres and external providers. Other plans include IT plans totalling CHF 88 million.

In 2017 total global restructuring costs were CHF 1.2 billion. Further details are given in Note 7 to the Annual Financial Statements.

Impairment of goodwill and intangible assets

Pharmaceuticals Division. There were impairment charges of CHF 2.4 billion, with the major item being net expenses of CHF 1.8 billion relating to the goodwill and intangible assets from the InterMune acquisition in 2014.

During 2018 the Group made a comprehensive reassessment of the cash-generating units used for allocating goodwill in the Pharmaceuticals Division, as detailed in Note 9 to the Annual Financial Statements. This reassessment was made in light of the following factors:

- Ongoing business transformations within the Pharmaceuticals Division during 2018.
- The acquisition of Flatiron Health effective April 2018 and the transaction to fully acquire Foundation Medicine effective July 2018.
- The early adoption of the amendments to IFRS 3 'Business Combinations' that were issued in October 2018. These amendments further clarify the definition of a business and whether a transaction represents in substance the purchase of a business or a single asset or group of similar assets.

The Group reviewed the assets and liabilities that were acquired in 2014 from the InterMune transaction in detail including the initial valuations, the reports made for the purposes of the acquisition accounting and subsequent integration process. The conclusion of this review was that, apart from the intangible asset representing the acquired rights to Esbriet and the related deferred taxation liabilities, there were no other assets or liabilities recorded on the Group's balance sheet, no other revenue streams and no other parts of the acquired company that had any synergistic benefits for the continued operations of the Roche Group.

In substance, as at 31 December 2018, the remaining value to the Group from the InterMune acquisition is estimated at CHF 2.4 billion. This solely relates to the acquired rights to Esbriet and should be reported in the Group's balance sheet as a product intangible asset in use. Therefore the previously recorded impairment on the Esbriet product intangible asset in use was partially reversed and the asset concerned was written up to its estimated recoverable value of CHF 2.4 billion. An income of CHF 0.3 billion was recorded for this. The main factor leading to this was an increase in forecasted cash flows relative to the previous year's long-term forecast due to an improvement in sales expectations.

A full impairment of CHF 2.0 billion was recorded for the goodwill from the InterMune acquisition. There is no surplus from Esbriet revenues to support the carrying value of the goodwill, neither are there any synergistic benefits to other products in the same therapeutic area. Accordingly the separable recoverable value of this goodwill is estimated to be zero and it has been fully impaired.

This reassessment of the cash-generating units used for allocating goodwill in the Pharmaceuticals Division, and the resulting impairment entries recorded, aligns historic transactions with transactions from 2018 onwards, which will use the revised IFRS 3 definition of a business that was detailed above in the section on 'Mergers and acquisitions'.

Other impairments in the Pharmaceuticals Division totalled CHF 0.6 billion, of which the largest were impairment charges of CHF 0.2 billion related to the Trophos acquisition from 2015. This follows from the decision to stop the development of the compound acquired. There was a decrease in the contingent consideration provisions, mainly due to the reversal of the remaining provision related to the Trophos acquisition, which contributed to the income of CHF 0.1 billion.

Diagnostics Division. The Diagnostics Division recorded impairment charges of CHF 1.0 billion. The major part of this was in the sequencing business with impairment charges of CHF 0.6 billion. These impairments are due to a change in the commercialisation strategy for related products, a change in timelines for future product development and a decrease in forecasted cash flows from revised sales assumptions. In addition, in the Centralised and Point of Care Solutions business, a full impairment of CHF 0.4 billion was recorded against the goodwill and product intangible assets acquired as part of the Constitution Medical Investors acquisition from 2013. This was due to a decision to change the commercialisation strategy for diagnostics instruments used in haematology testing.

In 2017 there were impairment charges of CHF 2.6 billion in the Pharmaceuticals Division. The largest item was a charge of CHF 1.7 billion for the partial impairment of the Esbriet product intangible acquired as part of the InterMune acquisition. The Diagnostics Division recorded impairment charges of CHF 0.9 billion. The major part of this was in the sequencing business.

Further details are given in Notes 9 and 10 to the Annual Financial Statements.

Legal and environmental cases

There were no significant developments in 2018. In 2017, based on the development of the various litigations, notably the Accutane case, some of the provisions previously held were released, resulting in income of CHF 219 million in 2017. Further details are given in Note 20 to the Annual Financial Statements.

Net income and earnings per share

IFRS net income increased by 23% in CHF terms and by 24% at CER, while the diluted EPS increased by 22% in CHF terms and by 23% at CER. Core net income increased by 20% at CER and Core EPS increased by 19%. The core basis excludes non-core items such as global restructuring costs, amortisation and impairment of goodwill and intangible assets, and income and impacts from the accounting for merger and acquisition transactions and alliance arrangements. Core EPS increased by 8% at CER when excluding the impact of the 2017 changes to the US tax rates effective from 1 January 2018.

Net income

	2018 (CHF m)	2017 (CHF m)	% change (CHF)	% change (CER)
IFRS net income	**10,865**	**8,825**	**+23**	**+24**
Reconciling items (net of tax)				
– Global restructuring plans	759	962	–21	–22
– Intangible asset amortisation	1,110	1,178	–6	–6
– Goodwill and intangible asset impairment	3,107	2,651	+17	+18
– Mergers and acquisitions and alliance transactions	21	(347)	–	–
– Legal and environmental cases	131	(30)	–	–
– Pension plan settlements	4	18	–78	–79
– Transitional effect of changes in US tax rates	(35)	116	–	–
– Normalisation of equity compensation plan tax benefit	19	31	–39	–38
Core net income	**15,981**	**13,404**	**+19**	**+20**

Supplementary net income and EPS information is given on pages 155 to 158. This includes calculations of Core EPS and reconciles the core results to the Group's published IFRS results.

Financial position

Financial position

	2018 (CHF m)	2017 (CHF m)	% change (CHF)	% change (CER)
Pharmaceuticals				
Net working capital	2,472	3,420	–28	–23
Long-term net operating assets	25,215	23,539	+7	+7
Diagnostics				
Net working capital	2,697	2,594	+4	+12
Long-term net operating assets	11,625	12,849	–10	–8
Corporate				
Net working capital	(214)	(119)	+80	+79
Long-term net operating assets	(44)	(178)	–75	–76
Net operating assets	**41,751**	**42,105**	**–1**	**0**
Net debt	(5,652)	(6,963)	–19	–19
Pensions	(6,140)	(6,620)	–7	–5
Income taxes	(89)	21	–	–
Other non-operating assets, net	496	464	+7	+6
Total net assets	**30,366**	**29,007**	**+5**	**+6**

Compared to the start of the year the Swiss franc appreciated against many currencies, notably the euro and, to a lesser extent, the Brazilian real. This was partly offset by the depreciation of the Swiss franc against the Japanese yen and the US dollar. Overall this had a negative translation impact on total net assets. The exchange rates used are given on page 29.

In the Pharmaceuticals Division net working capital decreased by 23% at CER. This mainly arose from lower inventories due to write-offs, lower inventory levels for certain mature products and strong sales. Long-term net operating assets increased by 7% mainly as a result of the Ignyta and Flatiron Health acquisitions, which more than offset goodwill impairment charges. In the Diagnostics Division the increase in net working capital of 12% at CER was driven by increases in trade receivables, due to business growth especially in China and Japan, and an increase in inventories of instruments pending installation. Long-term net operating assets in the Diagnostics Division decreased by 8% following impairment charges to goodwill and intangible assets.

The decrease in net debt was due to the free cash flow of CHF 14.8 billion, partly offset by the dividend payments of CHF 7.3 billion. In addition there were payments of CHF 3.4 billion for mergers and acquisitions and payments of CHF 2.3 billion for acquiring full ownership of Foundation Medicine. The net pension liability was 7% lower at CHF 6.1 billion due to an increase in discount rates partially offset by changes in the fair value of plan assets. The net tax liabilities increased mainly due to the deferred tax effects from the change in net pension liabilities.

Free cash flow

Free cash flow

	2018 (CHF m)	2017 (CHF m)	% change (CHF)	% change (CER)
Pharmaceuticals	17,851	16,817	+6	+6
Diagnostics	1,416	1,553	–9	–8
Corporate	(526)	(543)	–3	–3
Operating free cash flow	**18,741**	**17,827**	**+5**	**+5**
Treasury activities	(642)	(498)	+29	+32
Taxes paid	(3,288)	(3,909)	–16	–16
Free cash flow	**14,811**	**13,420**	**+10**	**+11**

See pages 158–160 for the definition of free cash flow and a detailed breakdown.

The Group's operating free cash flow for 2018 was CHF 18.7 billion, an increase of 5% at CER. This was due to the high cash generation of the business, with sales growth exceeding the increases in cash expenses. This was partly offset by higher capital expenditure. The free cash flow was CHF 14.8 billion, an increase of 11% at CER compared to 2017. This arose from the higher operating free cash flow and lower income tax payments in 2018.

Pharmaceuticals Division operating results

Pharmaceuticals Division operating results

	2018 (CHF m)	2017 (CHF m)	% change (CHF)	% change (CER)
IFRS results				
Sales	43,967	41,220	+7	+7
Royalties and other operating income	2,553	2,284	+12	+12
Revenue	**46,520**	**43,504**	**+7**	**+7**
Cost of sales	(10,491)	(11,978)	–12	–12
Marketing and distribution	(7,068)	(6,960)	+2	+2
Research and development	(10,299)	(9,704)	+6	+6
General and administration	(3,874)	(1,620)	+139	+140
Operating profit	**14,788**	**13,242**	**+12**	**+13**
– margin, % of sales	33.6	32.1	+1.5	+1.6
Core results[1]				
Sales	43,967	41,220	+7	+7
Royalties and other operating income	2,553	2,284	+12	+12
Revenue	**46,520**	**43,504**	**+7**	**+7**
Cost of sales	(9,504)	(8,707)	+9	+10
Marketing and distribution	(6,939)	(6,720)	+3	+4
Research and development	(9,586)	(9,036)	+6	+6
General and administration	(1,549)	(1,440)	+8	+8
Core operating profit	**18,942**	**17,601**	**+8**	**+8**
– margin, % of sales	43.1	42.7	+0.4	+0.5
Financial position				
Net working capital	2,472	3,420	–28	–23
Long-term net operating assets	25,215	23,539	+7	+7
Net operating assets	**27,687**	**26,959**	**+3**	**+3**
Free cash flow[2]				
Operating free cash flow	17,851	16,817	+6	+6
– margin, % of sales	40.6	40.8	–0.2	–0.3

1) See pages 155–158 for the definition of core results.
2) See pages 158–160 for the definition of free cash flow.

Sales overview

Pharmaceuticals Division – Sales by therapeutic area

	2018 (CHF m)	2017 (CHF m)	% change (CER)	% of sales (2018)	% of sales (2017)
Oncology	26,183	25,743	+2	59.6	62.5
Immunology	8,160	7,611	+8	18.6	18.5
Neuroscience	3,005	1,542	+96	6.8	3.7
Ophthalmology	1,659	1,414	+18	3.8	3.4
Infectious diseases	1,084	1,357	–20	2.5	3.3
Other therapeutic areas	3,876	3,553	+9	8.7	8.6
Total sales	**43,967**	**41,220**	**+7**	**100**	**100**

Sales in the Pharmaceuticals Division were CHF 44.0 billion, an increase of 7% at CER. New product sales more than compensated for the growing impacts of biosimilar competition for MabThera/Rituxan and Herceptin in Europe.

The sales growth was driven by the continuing rollout of the new products Ocrevus, Perjeta, Tecentriq, Alecensa and Hemlibra, which together contributed an additional CHF 2.9 billion (CER) of new sales. Ocrevus in particular continued its strong performance with total sales now reaching CHF 2.4 billion (2017: 0.9 billion) due to continuing growth in the US and strong initial uptake in other markets, notably in Germany. Perjeta sales were up by 27% to CHF 2.8 billion due to increased demand in early-stage adjuvant settings in the US and continued growth in neoadjuvant and metastatic settings in Europe.

Biosimilar competition had a negative impact, with continuing erosion for MabThera/Rituxan in Europe and the first biosimilar launches of Herceptin in Europe and MabThera/Rituxan and Herceptin in Japan. Sales of these two products fell by CHF 1.3 billion (CER) in Europe and Japan in 2018. The first biosimilar versions of MabThera/Rituxan had been expected to come to market in the US in mid- to end-2018. The first biosimilar versions of MabThera/Rituxan, Herceptin and Avastin are now anticipated to come to market in the US in the second half of 2019. In total, MabThera/Rituxan, Herceptin and Avastin sales in 2018 were CHF 20.6 billion, a decrease of 2%.

Oncology remains the Division's largest therapeutic area with total growth of 2% with the new products Perjeta, Tecentriq and Alecensa being major contributors. Avastin sales increased by 3%, mainly due to growth in China. Herceptin sales were 1% higher, with growth in the US offsetting the initial impact from the biosimilar competition in Europe. MabThera/Rituxan sales fell following biosimilar launches in Europe. In Japan, the recent biosimilar launches had a limited impact on MabThera/Rituxan and Herceptin sales, with the main factor of the sales decline being government price cuts. Tecentriq (increase of 59%) and Alecensa (increase of 76%) both reported continuing post-launch uptake. Sales of Tarceva fell by 36% due to competitive pressure in the US.

Sales in immunology grew, with Actemra/RoActemra, Xolair and Esbriet all increasing by over 10%. Lucentis sales grew 18% in the US driven by increased market share across all indications. Infectious diseases sales were 20% lower due mainly to the patent expiry of Tamiflu in the US and other major markets in 2016. The new influenza medicine Xofluza was launched in the US in late 2018 and initial sales were CHF 13 million. In other therapeutic areas, sales of Activase/TNKase were 6% higher in the US. The launch and rollout of Hemlibra, a medicine for haemophilia A, continued and sales in 2018 were CHF 224 million, mostly in the US, major EU markets and Japan.

Product sales

Pharmaceuticals Division – Sales

	2018 (CHF m)	2017 (CHF m)	% change (CER)	% of sales (2018)	% of sales (2017)
Oncology					
Herceptin	6,982	7,014	+1	15.9	17.0
Avastin	6,849	6,688	+3	15.6	16.2
MabThera/Rituxan [1]	5,191	5,832	–10	11.8	14.1
Perjeta	2,773	2,196	+27	6.3	5.3
Kadcyla	979	914	+8	2.2	2.2
Tecentriq	772	487	+59	1.8	1.2
Alecensa	637	362	+76	1.4	0.9
Tarceva	538	843	–36	1.2	2.0
Xeloda	427	453	–6	1.0	1.1
Gazyva/Gazyvaro	390	278	+40	0.9	0.7
Others	645	676	–2	1.5	1.8
Total Oncology	**26,183**	**25,743**	**+2**	**59.6**	**62.5**
Immunology					
Actemra/RoActemra	2,160	1,926	+12	4.9	4.7
Xolair	1,912	1,742	+11	4.3	4.2
MabThera/Rituxan [1]	1,561	1,556	+1	3.6	3.8
Esbriet	1,031	869	+19	2.3	2.1
Pulmozyme	739	730	+2	1.7	1.8
CellCept	669	697	–4	1.5	1.7
Others	88	91	–13	0.3	0.2
Total Immunology	**8,160**	**7,611**	**+8**	**18.6**	**18.5**
Neuroscience					
Ocrevus	2,353	869	+172	5.3	2.1
Madopar	341	334	+3	0.8	0.8
Others	311	339	–7	0.7	0.8
Total Neuroscience	**3,005**	**1,542**	**+96**	**6.8**	**3.7**
Ophthalmology					
Lucentis	1,659	1,414	+18	3.8	3.4
Total Ophthalmology	**1,659**	**1,414**	**+18**	**3.8**	**3.4**
Infectious diseases					
Tamiflu	378	535	–29	0.9	1.3
Rocephin	305	299	+1	0.7	0.7
Others	401	523	–23	0.9	1.3
Total Infectious diseases	**1,084**	**1,357**	**–20**	**2.5**	**3.3**
Other therapeutic areas					
Activase/TNKase	1,284	1,219	+6	2.9	3.0
Mircera	532	505	+5	1.2	1.2
NeoRecormon/Epogin	288	312	–9	0.7	0.8
Others	1,772	1,517	+17	3.9	3.6
Total other therapeutic areas	**3,876**	**3,553**	**+9**	**8.7**	**8.6**
Total sales	**43,967**	**41,220**	**+7**	**100**	**100**

1) Total MabThera/Rituxan sales of CHF 6,752 million (2017: CHF 7,388 million) split between oncology and immunology therapeutic areas.

MabThera/Rituxan. For non-Hodgkin lymphoma (NHL), chronic lymphocytic leukaemia (CLL), follicular lymphoma (FL) and rheumatoid arthritis (RA) as well as certain types of antineutrophil cytoplasmic antibody (ANCA)-associated vasculitis.

MabThera/Rituxan regional sales

	2018 (CHF m)	2017 (CHF m)	% change (CER)	% of sales (2018)	% of sales (2017)
United States	4,290	4,133	+4	63.5	55.9
Europe	916	1,690	–47	13.6	22.9
Japan	188	293	–36	2.8	4.0
International	1,358	1,272	+11	20.1	17.2
Total sales	**6,752**	**7,388**	**–8**	**100**	**100**

Sales were 8% lower, driven by Europe where sales fell by 47% due to the launch of biosimilars in most EU markets. In the US, where MabThera/Rituxan is widely used across nearly all approved indications, sales increased by 4%. There was growth in both the immunology and oncology segments, also driven by the subcutaneous formulation. The first biosimilar launches had been expected in the US in mid- to end-2018, but now could come to market in the second half of 2019. Sales were also higher in the International region, particularly in China (+40%) due to broader market penetration. In Japan sales were adversely affected by government price cuts and, to a limited extent, by the first biosimilar versions which were launched in 2018.

HER2 franchise (Herceptin, Perjeta and Kadcyla). For HER2-positive breast cancer and HER2-positive metastatic (advanced) gastric cancer (Herceptin only).

Herceptin regional sales

	2018 (CHF m)	2017 (CHF m)	% change (CER)	% of sales (2018)	% of sales (2017)
United States	2,908	2,697	+9	41.6	38.5
Europe	1,849	2,123	–16	26.5	30.3
Japan	249	295	–16	3.6	4.2
International	1,976	1,899	+10	28.3	27.0
Total sales	**6,982**	**7,014**	**+1**	**100**	**100**

Perjeta regional sales

	2018 (CHF m)	2017 (CHF m)	% change (CER)	% of sales (2018)	% of sales (2017)
United States	1,325	1,013	+32	47.8	46.1
Europe	915	767	+15	33.0	34.9
Japan	143	120	+18	5.2	5.5
International	390	296	+45	14.0	13.5
Total sales	**2,773**	**2,196**	**+27**	**100**	**100**

Kadcyla regional sales

	2018 (CHF m)	2017 (CHF m)	% change (CER)	% of sales (2018)	% of sales (2017)
United States	359	343	+5	36.7	37.5
Europe	376	347	+5	38.4	38.0
Japan	75	70	+6	7.7	7.7
International	169	154	+22	17.2	16.8
Total sales	**979**	**914**	**+8**	**100**	**100**

Sales in the HER2 franchise grew by 7% to CHF 10.7 billion of sales. Herceptin sales were 1% higher overall, driven by growth in the US and in the International region largely offset by falls in Europe and Japan. Factors in the US growth of 9% include the rollout of the new formulation launched in 2017 and longer duration of treatment in combination with Perjeta. In the International region, growth of 10% was driven by China due to broader market penetration. Herceptin sales in Europe were 16% lower due to the first biosimilar launches from mid-2018. Biosimilar launches also had an impact on Herceptin sales in Japan. Sales of Perjeta grew by 27% with increased demand in all regions, notably in the early breast cancer adjuvant setting in the US, Europe, Japan and Brazil. Kadcyla sales increased in particular in the International region (+22%).

Avastin. For advanced colorectal, breast, lung, kidney, cervical and ovarian cancer, and relapsed glioblastoma (a type of brain tumour).

Avastin regional sales

	2018 (CHF m)	2017 (CHF m)	% change (CER)	% of sales (2018)	% of sales (2017)
United States	2,904	2,894	+1	42.4	43.3
Europe	1,820	1,776	–1	26.6	26.6
Japan	847	817	+3	12.4	12.2
International	1,278	1,201	+12	18.6	17.9
Total sales	**6,849**	**6,688**	**+3**	**100**	**100**

Overall sales increased by 3% compared to prior year. In the International region, sales grew by 12%, in particular with broader market penetration in China. US sales increased by 1% due to growth in front-line ovarian cancer (following FDA approval in June 2018) and colorectal cancer. In Japan sales increased by 3% due to steady growth for ovarian cancer. In Europe sales declined by 1%, with France being the largest factor.

Actemra/RoActemra. For rheumatoid arthritis (RA), systemic juvenile idiopathic arthritis, polyarticular juvenile idiopathic arthritis and giant cell arteritis.

Actemra/RoActemra regional sales

	2018 (CHF m)	2017 (CHF m)	% change (CER)	% of sales (2018)	% of sales (2017)
United States	857	756	+14	39.7	39.3
Europe	701	631	+7	32.5	32.8
Japan	354	304	+15	16.4	15.8
International	248	235	+15	11.4	12.1
Total sales	**2,160**	**1,926**	**+12**	**100**	**100**

Sales increased by 12%, with growth in all regions, driven by continued uptake of the subcutaneous formulation, notably in the recently approved giant cell arteritis indication. The US and Japan were the major contributors to the sales increase, along with major EU markets, Brazil and Australia.

Xolair. For moderate to severe persistent allergic asthma (AA) and chronic idiopathic urticaria (CIU).

Xolair regional sales

	2018 (CHF m)	2017 (CHF m)	% change (CER)	% of sales (2018)	% of sales (2017)
United States	1,912	1,742	+11	100	100
Total sales	**1,912**	**1,742**	**+11**	**100**	**100**

Sales grew by 11%, driven by demand growth in chronic idiopathic urticaria and expansion of the overall asthma market. Xolair remains the market leader in the larger allergic asthma indication.

Ocrevus. For relapsing forms of multiple sclerosis (RMS) and primary progressive multiple sclerosis (PPMS).

Ocrevus regional sales

	2018 (CHF m)	2017 (CHF m)	% change (CER)	% of sales (2018)	% of sales (2017)
United States	2,080	860	+144	88.4	99.0
Europe	206	4	Over +500	8.8	0.5
International	67	5	Over +500	2.8	0.5
Total sales	**2,353**	**869**	**+172**	**100**	**100**

There was continuously growing demand in both indications in the US in 2018, with growth driven both by new patients and by returning patients. Ocrevus was launched in the US in April 2017 so the comparative period includes only 9 months of sales during the initial launch phase. Elsewhere Ocrevus is showing strong initial uptake where launched, notably in Germany.

Lucentis. For wet age-related macular degeneration (wet AMD), macular oedema following retinal vein occlusion (RVO), diabetic macular oedema (DME) and diabetic retinopathy (DR).

Lucentis regional sales

	2018 (CHF m)	2017 (CHF m)	% change (CER)	% of sales (2018)	% of sales (2017)
United States	1,659	1,414	+18	100	100
Total sales	**1,659**	**1,414**	**+18**	**100**	**100**

US sales grew 18% driven by increased market share across all indications and the ongoing rollout of prefilled syringes.

Activase/TNKase. For acute ischaemic stroke (AIS) and acute myocardial infarction (AMI).

Activase/TNKase regional sales

	2018 (CHF m)	2017 (CHF m)	% change (CER)	% of sales (2018)	% of sales (2017)
United States	1,231	1,168	+6	96.0	95.8
International	53	51	+5	4.0	4.2
Total sales	**1,284**	**1,219**	**+6**	**100**	**100**

Sales were 6% higher, led by the US, and mainly driven by broader use in hospitals and a higher number of patients being treated.

Esbriet. For idiopathic pulmonary fibrosis (IPF).

Esbriet regional sales

	2018 (CHF m)	2017 (CHF m)	% change (CER)	% of sales (2018)	% of sales (2017)
United States	754	640	+19	73.1	73.6
Europe	230	190	+17	22.3	21.9
International	47	39	+29	4.6	4.5
Total sales	**1,031**	**869**	**+19**	**100**	**100**

Sales grew by 19%, with growth in both the US and Europe, in part driven by the launch of a new tablet formulation.

Tecentriq. For advanced bladder cancer, advanced lung cancer and initial therapy of non-squamous non-small cell lung cancer (NSCLC). Sales grew by 59% to CHF 772 million due to the post-launch uptake in Europe, notably in Germany, and also due to the launch in Japan in 2018.

Alecensa. For ALK-positive non-small cell lung cancer. The global uptake continued with a 76% increase in sales to CHF 637 million, with growth across all regions, notably in the US which reported a 65% sales growth.

Pharmaceuticals Division – Sales by region

	2018 (CHF m)	2017 (CHF m)	% change (CER)	% of sales (2018)	% of sales (2017)
United States	23,233	20,496	+14	52.8	49.7
Europe	8,693	9,051	–7	19.8	22.0
Japan	3,701	3,713	–1	8.4	9.0
International	8,340	7,960	+10	19.0	19.3
– EEMEA[1)]	*1,416*	*1,524*	*–1*	*3.2*	*3.7*
– Latin America	*2,004*	*2,121*	*+9*	*4.6*	*5.1*
– Asia-Pacific	*3,931*	*3,397*	*+15*	*8.9*	*8.2*
– Other regions	*989*	*918*	*+9*	*2.3*	*2.3*
Total sales	**43,967**	**41,220**	**+7**	**100**	**100**

1) Eastern Europe, Middle East and Africa.

United States. Sales grew by 14% led by the continued uptake of Ocrevus, which was launched in April 2017. The HER2 franchise grew 14%, with sales increase of Perjeta in particular in the early breast cancer adjuvant setting as well as sales growth for Herceptin. Lucentis sales increased by 18% due to the ongoing rollout of prefilled syringes, with increased market share in all approved indications. Hemlibra and Alecensa sales showed a strong initial uptake. Sales of Tarceva fell 49% due to competitive pressure. Mandatory discounts to hospitals under the 340B Drug Discount Program increased due to higher sales, notably for Ocrevus and oncology products.

Europe. Sales declined 7% due to increasing biosimilar penetration of MabThera/Rituxan in most EU markets, notably in Germany, France and the UK. Herceptin sales declined by 16% due to biosimilar launches in major EU markets from mid-2018. This negative impact on sales was partly offset by the launches of Ocrevus, Tecentriq, Perjeta as well as Alecensa and Gazyva/Gazyvaro, in particular in Germany. Actemra/RoActemra sales increased due to continued uptake of the subcutaneous formulation.

Japan. Sales decreased by 1% due to the 2018 government price cuts which had an annualised negative effect on sales of approximately 5.9%. In particular, MabThera/Rituxan (–36%) and Herceptin (–16%) sales were both negatively affected. Tamiflu (–37%) sales decreased due to lower government stockpiles. This was partially offset by higher sales of Tecentriq, which was launched in 2018, Actemra/RoActemra (+15%) and Alecensa (+27%).

International. Sales increased by 10% driven by the Asia-Pacific and Latin America subregions. Sales in China grew due to broader market penetration for Avastin, MabThera/Rituxan and Herceptin. Sales in Brazil increased mainly due to higher sales of Perjeta, MabThera/Rituxan and Actemra/RoActemra. In Turkey the main drivers of growth were Avastin and MabThera/Rituxan, while in Russia sales growth was driven by higher sales across the HER2 franchise.

Pharmaceuticals Division – Sales for E7 leading emerging markets

	2018 (CHF m)	2017 (CHF m)	% change (CER)	% of sales (2018)	% of sales (2017)
Brazil	909	958	+9	2.1	2.3
China	2,307	1,799	+27	5.2	4.3
India	62	63	+4	0.1	0.2
Mexico	260	280	–5	0.6	0.7
Russia	127	98	+37	0.3	0.2
South Korea	340	319	+4	0.8	0.8
Turkey	257	286	+19	0.6	0.7
Total sales	**4,262**	**3,803**	**+18**	**9.7**	**9.2**

Competition from generic medicines and biosimilars

The Group's pharmaceutical products are generally protected by patent rights which are intended to provide the Group with exclusive marketing rights in various countries. However, patent rights are of varying scope and duration, and the Group may be required to enter into costly litigation to enforce its patent and other intellectual property rights. Loss of market exclusivity for one or more major products – either due to patent expiration, challenges from generic medicines, biosimilars and non-comparable biologics or other reasons – could have a material adverse effect on the Group's business, results of operations or financial condition. The introduction of a generic, biosimilar or non-comparable biologic version of the same or a similar medicine typically results in a significant reduction in net sales for the relevant product, as other manufacturers typically offer their versions at lower prices.

Patents and their expiry are, and always have been, an integral part of the Group's business model and future growth will remain driven by innovation. The latest information from clinical studies is included in the Annual Report on pages 40 to 55 and details of the Group's Product Development Portfolio are available for download at:
http://www.roche.com/research_and_development/who_we_are_how_we_work/pipeline.htm

2018 product sales affected by recent patent expiry

	2018 (CHF m)	2017 (CHF m)	% change (CER)	Comment
Tamiflu	378	535	–29	Patent expiry in US and other major markets in 2016

The intellectual property for biologics can involve multiple patents and patent timelines for each individual product and therefore it is more difficult to give an exact date for patent expiry for biologic medicines. The Group currently estimates that some basic, primary patents for its major biologic medicines will begin to expire as follows:

- MabThera/Rituxan: from around mid-2018 in the US.
- Herceptin: from mid-2019 in the US.
- Avastin: from mid-2019 in the US and from around 2020 in the EU.
- Subcutaneous formulations of MabThera/Rituxan and Herceptin: beyond 2025 (secondary patent rights).

The 'composition of matter' patents for MabThera/Rituxan and Herceptin in the EU have expired. The first biosimilar versions of MabThera/Rituxan were launched in Europe from mid-2017. They are now marketed in most EU countries and were the major factor in the sales decline of this product in Europe in 2018. The first biosimilar versions of Herceptin have been launched in major EU markets from mid-2018. In Japan, the first biosimilar versions of MabThera/Rituxan and Herceptin were launched in 2018 and sales were also adversely affected by government price cuts. In total, sales of MabThera/Rituxan and Herceptin fell by CHF 1.3 billion (CER) in Europe and Japan during 2018. The Group had anticipated the first biosimilar versions of MabThera/Rituxan in the US in mid- to end-2018, but these could now come to market in the second half of 2019.

2018 product sales affected by biosimilar launches

	2018 (CHF m)	2017 (CHF m)	% change (CER)	Comment
MabThera/Rituxan – Europe	916	1,690	–47	First biosimilar launches from mid-2017
Herceptin – Europe	1,849	2,123	–16	First biosimilar launches from mid-2018
MabThera/Rituxan – Japan	188	293	–36	First biosimilar launches from early 2018
Herceptin – Japan	249	295	–16	First biosimilar launches from mid-2018

Based on publicly available information from competitor companies, the Group currently anticipates the following potential developments in 2019:

- In the US, there are still many uncertainties about when specific biosimilar versions of the Group's biologic medicines will be approved by the Food and Drug Administration. The first biosimilar versions of MabThera/Rituxan, Herceptin and Avastin could come to market in the US in the second half of 2019.

Sales in 2018 for MabThera/Rituxan, Herceptin and Avastin are disclosed above in the previous sections, including regional breakdowns. These are summarised in the table below. As noted in the previous sections, the year-on-year movements are also driven by regular price and volume changes. Biosimilar competition is only one factor in the overall picture.

Total MabThera/Rituxan, Herceptin and Avastin sales

	2018 (CHF m)	2017 (CHF m)	% change (CER)	% of sales (2018)	% of sales (2017)
United States	10,102	9,724	+5	23.0	23.6
Europe	4,585	5,589	–21	10.4	13.6
Japan	1,284	1,405	–9	2.9	3.4
International	4,612	4,372	+11	10.5	10.6
Total sales	**20,583**	**21,090**	**–2**	**46.8**	**51.2**

The Group derives royalty income from US Patent No. 6,331,415 (known as the Cabilly patent). This patent expired in December 2018 and therefore, while there will be certain residual income after the expiry, the Group expects that royalty income in 2019 will be significantly lower than in 2018. Annual royalty income in 2018 from the Cabilly patent was CHF 929 million.

Operating results

Pharmaceuticals Division – Royalties and other operating income

	2018 (CHF m)	2017 (CHF m)	% change (CER)
Royalty income	1,670	1,551	+8
Income from out-licensing agreements	267	122	+119
Income from disposal of products and other	616	611	+1
Total – IFRS and Core basis	**2,553**	**2,284**	**+12**

Royalties and other operating income increased by 12% at CER. Royalty income was 8% higher due to a net increase in sales across the royalty portfolio. Out-licensing income increased due to higher milestone income. There was income of CHF 87 million from the sales of the worldwide rights for Konakion and Valcyte/Cymevene (excluding Brazil) and in Japan there was CHF 240 million of other operating income, mainly from the sale of the rights for established products by Chugai.

Pharmaceuticals Division – Cost of sales

	2018 (CHF m)	2017 (CHF m)	% change (CER)
Manufacturing cost of goods sold and period costs	(5,961)	(5,562)	+8
Royalty expenses	(1,099)	(852)	+30
Collaboration and profit-sharing agreements	(2,390)	(2,271)	+6
Impairment of property, plant and equipment	(54)	(22)	+142
Cost of sales – Core basis	**(9,504)**	**(8,707)**	**+10**
Global restructuring plans	(292)	(377)	–24
Amortisation of intangible assets	(969)	(1,230)	–21
Impairment of intangible assets	274	(1,664)	–
Total – IFRS basis	**(10,491)**	**(11,978)**	**–12**

Core costs increased by 10% at CER. As a percentage of sales, cost of sales increased by 0.5 percentage points to 21.6%. Manufacturing cost of sales grew by 8%, ahead of the sales growth of 7%, due to volume growth and higher inventory write-offs, partially offset by a favourable product mix. Royalty expenses were 30% higher due to increased sales for certain products, notably Ocrevus. Non-core costs include the amortisation and impairment of intangible assets mainly related to the Esbriet product intangibles. The 2017 results included CHF 1,664 million of impairment of these intangible assets and consequently the amortisation charges in 2018 were lower. At the end of 2018, based on an improved future sales outlook, the previous impairment was partly reversed and CHF 274 million was written back.

Pharmaceuticals Division – Marketing and distribution

	2018 (CHF m)	2017 (CHF m)	% change (CER)
Marketing and distribution – Core basis	**(6,939)**	**(6,720)**	**+4**
Global restructuring plans	(97)	(234)	–58
Amortisation of intangible assets	(32)	(6)	+453
Total – IFRS basis	**(7,068)**	**(6,960)**	**+2**

Core costs increased by 4% at CER. As a percentage of sales, they decreased to 15.8% from 16.3% in the comparative period. This relative decrease resulted from various resourcing flexibility initiatives and other transformation activities. In 2018 costs were incurred to ensure increased patient access and for the launches of Ocrevus, Tecentriq and other products. Restructuring costs are related to the resourcing flexibility initiatives in sales affiliates, mainly in 2017. Amortisation of intangible assets includes the Flatiron Health marketing intangibles since April 2018.

Pharmaceuticals Division – Research and development

	2018 (CHF m)	2017 (CHF m)	% change (CER)
Research and development – Core basis	**(9,586)**	**(9,036)**	**+6**
Global restructuring plans	(76)	(21)	+289
Amortisation of intangible assets	(130)	(123)	+6
Impairment of intangible assets	(507)	(524)	–3
Total – IFRS basis	**(10,299)**	**(9,704)**	**+6**

Core costs increased by 6% at CER and, as a percentage of sales, decreased by 0.1 percentage points to 21.8%. The oncology therapeutic area remained the primary area of research and development with Tecentriq and the cancer immunotherapy portfolio being a key driver. Neuroscience and immunology also represent significant areas of spending. In addition, the Pharmaceuticals Division in-licensed pipeline compounds and technologies with a total value of CHF 803 million, which are capitalised as intangible assets. The impairment charges of CHF 507 million in 2018 include an impairment of CHF 100 million due to the decision to stop the development of the compound acquired as part of the Trophos acquisition. The other impairment charges relate to various portfolio decisions around the development of compounds with different alliance partners.

Pharmaceuticals Division – General and administration

	2018 (CHF m)	2017 (CHF m)	% change (CER)
Administration	(1,422)	(1,234)	+16
Pensions – past service costs	43	31	+39
Gains (losses) on disposal of property, plant and equipment	(14)	17	–
Business taxes and capital taxes	(173)	(293)	–41
Other general items	17	39	–57
General and administration – Core basis	**(1,549)**	**(1,440)**	**+8**
Global restructuring plans	(58)	(245)	–77
Impairment of goodwill and intangible assets	(2,147)	(384)	+461
Mergers and acquisitions and alliance transactions	(91)	324	–
Legal and environmental cases	(24)	143	–
Pensions – settlement gains (losses)	(5)	(18)	–70
Total – IFRS basis	**(3,874)**	**(1,620)**	**+140**

Core costs increased by 8% at CER and, as a percentage of sales, they remained stable at 3.5%. Administration costs increased mainly due to higher legal service costs. Business taxes and capital taxes fell due to decreased costs for the US Branded Prescription Drug Fee. Restructuring costs in 2017 relate to site divestments. The impairment charges in 2018 relate to the full write-off of goodwill from the InterMune and Trophos acquisitions. The mergers and acquisitions and alliance transactions expenses includes costs related to the Flatiron Health acquisition in 2018, partially offset by the reversal of the remaining contingent consideration provisions for the Trophos acquisition. In 2017 income of CHF 143 million arose from the release of legal provisions, notably the Accutane case.

Roche Pharmaceuticals and Chugai subdivisional operating results

Pharmaceuticals subdivisional operating results in millions of CHF

	Roche Pharmaceuticals		Chugai		Pharmaceuticals Division	
	2018	2017	2018	2017	2018	2017
Sales						
– External customers	40,266	37,507	3,701	3,713	43,967	41,220
– Within division	1,340	1,222	974	670	2,314	1,892
Core operating profit	17,806	16,729	1,186	881	18,942	17,601
– margin, % of sales to external customers	44.2	44.6	32.0	23.7	43.1	42.7
Operating profit	13,702	12,395	1,136	856	14,788	13,242
– margin, % of sales to external customers	34.0	33.0	30.7	23.1	33.6	32.1
Operating free cash flow	17,193	16,056	658	761	17,851	16,817
– margin, % of sales to external customers	42.7	42.8	17.8	20.5	40.6	40.8

Pharmaceuticals Division total core operating profit and operating profit both include the elimination of CHF minus 50 million of unrealised intercompany gains between Roche Pharmaceuticals and Chugai (2017: CHF minus 9 million).

The increase in the exchange rate of the Japanese yen has a positive impact of approximately 1% on the Chugai results when expressed in Swiss francs for the Group's consolidated results. At CER (as reported in Japanese yen), sales by Chugai to external customers were 1% lower compared to 2017 driven by the 2018 government price cuts which had an annualised negative effect on sales of approximately 5.9%. Sales within the division increased by 44% due to increased sales of Actemra/RoActemra and Alecensa to Roche Pharmaceuticals. Chugai's core operating profit increased by 33% due to the income from the divestment of established products and the higher gross profit from sales with Roche Pharmaceuticals. This was partially offset by increased research and development spending. Operating free cash flow at Chugai decreased due to the capital expenditure for the new research facilities being constructed at Yokohama.

Financial position

Pharmaceuticals Division – Net operating assets

	2018 (CHF m)	2017 (CHF m)	% change (CHF)	% change (CER)	Movement: Transactions (CHF m)	Movement: CTA (CHF m)
Trade receivables	6,746	6,569	+3	+6	325	(148)
Inventories	4,284	5,126	–16	–16	(817)	(25)
Trade payables	(1,642)	(1,765)	–7	–6	107	16
Net trade working capital	**9,388**	**9,930**	**–5**	**–4**	**(385)**	**(157)**
Other receivables (payables)	(6,916)	(6,510)	+6	+7	(441)	35
Net working capital	**2,472**	**3,420**	**–28**	**–23**	**(826)**	**(122)**
Property, plant and equipment	15,123	14,358	+5	+5	784	(19)
Goodwill and intangible assets	12,180	11,196	+9	+8	840	144
Provisions	(2,508)	(2,449)	+2	+4	(81)	22
Other long-term assets, net	420	434	–3	–3	(15)	1
Long-term net operating assets	**25,215**	**23,539**	**+7**	**+7**	**1,528**	**148**
Net operating assets	**27,687**	**26,959**	**+3**	**+3**	**702**	**26**

The absolute amount of the movement between the 2018 and 2017 consolidated balances reported in Swiss francs is split between actual 2018 transactions (translated at average rates for 2017) and the currency translation adjustment (CTA) that arises on consolidation. The 2018 transactions include non-cash movements and therefore the movements in this table are not the same as the amounts shown in the operating free cash flow (which only includes the cash movements). A full consolidated balance sheet is given on page 43 of the Annual Financial Statements, and a reconciliation between that balance sheet and the information given above is on page 161.

Currency translation effects on balance sheet amounts. Compared to the start of the year the Swiss franc depreciated significantly against the US dollar and the Japanese yen, resulting in a positive translation impact on net operating assets which was partly offset by the appreciation of the Swiss franc against the Brazilian real and the euro. The exchange rates used are given on page 29.

Net working capital. Net working capital decreased by 23%, mainly due to lower inventories and a higher net liability for other receivables/payables. Trade receivables were higher as a result of higher sales and extended payment terms for Ocrevus in the US. Inventories decreased due to higher inventory write-offs, lower inventory levels for certain mature products as well as due to strong sales. Trade payables were lower following the settlement of year-end positions. The net liability for other receivables/payables increased due to higher accruals for rebates and chargebacks.

Long-term net operating assets. Overall long-term net operating assets increased by 7%. Goodwill and intangible assets increased due to the acquisitions of Ignyta and Flatiron Health, partly offset by the impairments from the InterMune and Trophos assets. The major item in capital expenditure was Chugai's continued development of their new research facilities in Yokohama in Japan. At Roche, there were investments in site development at the Basel and Kaiseraugst sites in Switzerland and at the South San Francisco campus in the US as well as manufacturing investments in Switzerland, Germany and the US.

Free cash flow

Pharmaceuticals Division – Operating free cash flow

	2018 (CHF m)	2017 (CHF m)	% change (CHF)	% change (CER)
Operating profit	**14,788**	**13,242**	**+12**	**+13**
– Depreciation, amortisation and impairment	4,777	5,280	–10	–9
– Provisions	113	(303)	–	–
– Equity compensation plans	392	388	+1	+1
– Other	624	625	0	–9
Operating profit cash adjustments	**5,906**	**5,990**	**–1**	**–2**
Operating profit, net of operating cash adjustments	**20,694**	**19,232**	**+8**	**+8**
(Increase) decrease in net working capital	617	297	+108	+94
Investments in property, plant and equipment	(2,584)	(2,061)	+25	+25
Investments in intangible assets	(876)	(651)	+35	+35
Operating free cash flow	**17,851**	**16,817**	**+6**	**+6**
– as % of sales	40.6	40.8	–0.2	–0.3

See pages 158–160 for the definition of free cash flow and a detailed breakdown.

The Pharmaceuticals Division's operating free cash flow increased by 6% at CER to CHF 17.9 billion. The main contribution came from the underlying business, with operating profit, net of operating cash adjustments showing an increase of 8%. Net working capital was lower due to the increase in accruals for rebates and chargebacks and lower inventories. Capital expenditure was higher due to the land purchase in Yokohama, Japan, for Chugai's new research facilities and the final payment of the Genentech property lease option exercise. Investments in intangible assets were CHF 0.2 billion higher than in 2017.

Diagnostics Division operating results

Diagnostics Division operating results

	2018 (CHF m)	2017 (CHF m)	% change (CHF)	% change (CER)
IFRS results				
Sales	12,879	12,079	+7	+7
Royalties and other operating income	98	163	–40	–40
Revenue	**12,977**	**12,242**	**+6**	**+6**
Cost of sales	(6,778)	(6,201)	+9	+10
Marketing and distribution	(3,041)	(2,887)	+5	+5
Research and development	(1,793)	(1,588)	+13	+12
General and administration	(748)	(1,262)	–41	–41
Operating profit	**617**	**304**	**+103**	**+115**
– margin, % of sales	4.8	2.5	+2.3	+2.6
Core results[1]				
Sales	12,879	12,079	+7	+7
Royalties and other operating income	82	163	–50	–50
Revenue	**12,961**	**12,242**	**+6**	**+6**
Cost of sales	(5,960)	(5,659)	+5	+6
Marketing and distribution	(2,966)	(2,792)	+6	+6
Research and development	(1,461)	(1,356)	+8	+7
General and administration	(528)	(526)	0	0
Core operating profit	**2,046**	**1,909**	**+7**	**+9**
– margin, % of sales	15.9	15.8	+0.1	+0.3
Financial position				
Net working capital	2,697	2,594	+4	+12
Long-term net operating assets	11,625	12,849	–10	–8
Net operating assets	**14,322**	**15,443**	**–7**	**–5**
Free cash flow[2]				
Operating free cash flow	1,416	1,553	–9	–8
– margin, % of sales	11.0	12.9	–1.9	–1.8

1) See pages 155–158 for the definition of core results.
2) See pages 158–160 for the definition of free cash flow.

Sales

The Diagnostics Division reported sales growth of 7% at CER to CHF 12.9 billion. The main contributor was Centralised and Point of Care Solutions, led by its immunodiagnostics business, with 11% sales growth. Molecular Diagnostics sales increased by 5%, with growth of 6% in the underlying molecular business. The main growth factors were the cobas Liat system, blood screening and virology businesses. Diabetes Care sales increased by 2% driven by growth in North America and Latin America, offset by lower sales in Europe. The advanced staining product portfolio was the main driver in the 10% sales growth in Tissue Diagnostics.

Diagnostics Division – Sales by business area

	2018 (CHF m)	2017 (CHF m)	% change (CER)	% of sales (2018)	% of sales (2017)
Centralised and Point of Care Solutions	7,768	7,179	+8	60.3	59.4
Molecular Diagnostics	2,019	1,920	+5	15.7	15.9
Diabetes Care	1,980	1,965	+2	15.4	16.3
Tissue Diagnostics	1,112	1,015	+10	8.6	8.4
Total sales	**12,879**	**12,079**	**+7**	**100**	**100**

Centralised and Point of Care Solutions. This business area was the major contributor to the overall divisional results. The 8% sales growth was primarily driven by the immunodiagnostics business (+11%), which accounts for 33% of the division's sales. The clinical chemistry business (+7%) also was a factor in the sales development. The business is growing especially in Asia-Pacific (+15%) due to China, as well as in Europe, Middle East and Africa (EMEA) with 4% growth.

Centralised and Point of Care Solutions regional sales

	2018 (CHF m)	2017 (CHF m)	% change (CER)	% of sales (2018)	% of sales (2017)
Europe, Middle East and Africa (EMEA)	2,723	2,577	+4	35.1	35.9
North America	1,541	1,465	+6	19.8	20.4
Rest of the World	3,504	3,137	+13	45.1	43.7
Total sales	**7,768**	**7,179**	**+8**	**100**	**100**

Molecular Diagnostics. Overall sales rose by 5%, with the underlying molecular business reporting 6% growth. Sales in the sequencing business increased by 4%. The growth in the molecular business sales came from the cobas Liat system, blood screening and virology businesses. Regional growth was led by EMEA (+7%), notably in South Africa, due to order timing, and also by North America (+6%).

Molecular Diagnostics regional sales

	2018 (CHF m)	2017 (CHF m)	% change (CER)	% of sales (2018)	% of sales (2017)
Europe, Middle East and Africa (EMEA)	770	708	+7	38.1	36.9
North America	766	726	+6	37.9	37.8
Rest of the World	483	486	+1	24.0	25.3
Total sales	**2,019**	**1,920**	**+5**	**100**	**100**

Diabetes Care. Sales increased by 2%, driven by North America (+20%) and Latin America (+14%). Sales growth mainly came from Accu-Chek Guide and Accu-Chek Instant. Sales decreased by 4% in the EMEA region, mainly resulting from the market dynamics in France.

Diabetes Care regional sales

	2018 (CHF m)	2017 (CHF m)	% change (CER)	% of sales (2018)	% of sales (2017)
Europe, Middle East and Africa (EMEA)	1,212	1,236	–4	61.2	62.9
North America	265	221	+20	13.4	11.2
Rest of the World	503	508	+8	25.4	25.9
Total sales	**1,980**	**1,965**	**+2**	**100**	**100**

Tissue Diagnostics. Sales rose by 10%, with the advanced staining portfolio (+10%) contributing the majority of the growth. In addition, sales increased by 9% in the companion diagnostics and 13% in the primary staining business. Regionally, growth was led by North America (+8%) and EMEA (+10%). Asia-Pacific sales increased by 18%, with China as the main growth market.

Tissue Diagnostics regional sales

	2018 (CHF m)	2017 (CHF m)	% change (CER)	% of sales (2018)	% of sales (2017)
Europe, Middle East and Africa (EMEA)	281	252	+10	25.3	24.8
North America	641	599	+8	57.6	59.0
Rest of the World	190	164	+17	17.1	16.2
Total sales	**1,112**	**1,015**	**+10**	**100**	**100**

Diagnostics Division – Sales by region

	2018 (CHF m)	2017 (CHF m)	% change (CER)	% of sales (2018)	% of sales (2017)
Europe, Middle East and Africa (EMEA)	4,986	4,773	+3	38.7	39.5
Asia-Pacific	3,334	2,939	+13	25.9	24.4
North America	3,213	3,011	+7	24.9	24.9
Latin America	844	884	+9	6.6	7.3
Japan	502	472	+6	3.9	3.9
Total sales	**12,879**	**12,079**	**+7**	**100**	**100**

Centralised and Point of Care Solutions and Molecular Diagnostics were the main sales driver in the EMEA region, the division's largest market. In North America, the sales increase was spread over all business areas. The sales increase in Asia-Pacific was mainly in China, which grew by 16% driven by Centralised and Point of Care Solutions. Sales in Latin America rose by 9% again mainly driven by Centralised and Point of Care solutions, with Diabetes Care also contributing. Centralised and Point of Care Solutions also was the main factor in the 6% sales increase in Japan.

Diagnostics Division – Sales for E7 leading emerging markets

	2018 (CHF m)	2017 (CHF m)	% change (CER)	% of sales (2018)	% of sales (2017)
Brazil	245	283	0	1.9	2.3
China	2,208	1,882	+16	17.2	15.7
India	177	163	+15	1.4	1.3
Mexico	132	124	+10	1.0	1.0
Russia	159	147	+18	1.2	1.2
South Korea	223	203	+8	1.7	1.7
Turkey	120	131	+23	0.9	1.1
Total sales	**3,264**	**2,933**	**+14**	**25.3**	**24.3**

Operating results

Diagnostics Division – Royalties and other operating income

	2018 (CHF m)	2017 (CHF m)	% change (CER)
Royalty income	58	111	–49
Income from out-licensing agreements	2	27	–92
Income from disposal of products and other	22	25	–9
Royalties and other operating income – Core basis	**82**	**163**	**–50**
Global restructuring plans	16	0	–
Total – IFRS basis	**98**	**163**	**–40**

The expiry in late 2017 of royalty-bearing patents in Polymerase Chain Reaction (PCR) technology was the main factor behind the lower royalty income. The 2017 results for out-licensing income included the settlement of a patent dispute in that year. The global restructuring income related to a licensing deal from a portfolio prioritisation initiative.

Diagnostics Division – Cost of sales

	2018 (CHF m)	2017 (CHF m)	% change (CER)
Manufacturing cost of goods sold and period costs	(5,790)	(5,494)	+6
Royalty expenses	(169)	(165)	+2
Impairment of property, plant and equipment	(1)	–	–
Cost of sales – Core basis	**(5,960)**	**(5,659)**	**+6**
Global restructuring plans	(108)	(107)	–1
Amortisation of intangible assets	(142)	(315)	–55
Impairment of intangible assets	(568)	(120)	+376
Total – IFRS basis	**(6,778)**	**(6,201)**	**+10**

Core costs increased by 6% at CER, below the sales growth of 7%. The increase was due to higher sales volumes partially offset by favourable instruments and reagent mixes. The core cost of sales ratio decreased by 0.5 percentage points to 46.3%. Global restructuring costs were mainly due to Diagnostics strategy plans. Amortisation expenses were lower due to the product intangible assets from the Corange/Boehringer-Mannheim acquisition from 1997 which were fully amortised by the end of 2017. Impairment charges related to the impairment of the intangible assets in the sequencing business and from the Constitution Medical Investors acquisition from 2013.

Diagnostics Division – Marketing and distribution

	2018 (CHF m)	2017 (CHF m)	% change (CER)
Marketing and distribution – Core basis	**(2,966)**	**(2,792)**	**+6**
Global restructuring plans	(71)	(92)	–25
Amortisation of intangible assets	(4)	(3)	+51
Total – IFRS basis	**(3,041)**	**(2,887)**	**+5**

The increase in core costs was primarily due to higher spending in emerging markets in the Asia-Pacific and EMEA regions. Additionally, the increase also results from marketing software and the launch of new digital solutions. On a core basis, marketing and distribution costs as a percentage of sales decreased to 23.0% from 23.1% in 2017. Global restructuring costs consisted of organisational changes.

Diagnostics Division – Research and development

	2018 (CHF m)	2017 (CHF m)	% change (CER)
Research and development – Core basis	**(1,461)**	**(1,356)**	**+7**
Global restructuring plans	(34)	(66)	–50
Amortisation of intangible assets	(17)	(14)	+21
Impairment of intangible assets	(281)	(152)	+86
Total – IFRS basis	**(1,793)**	**(1,588)**	**+12**

Core costs increased due to higher spending in the Centralised and Point of Care Solutions portfolio in high/mid-volume systems. There was also increased spending to develop digital clinical decision support products and for the GE Healthcare collaboration. Spending in the sequencing business was also higher. As a percentage of sales, research and development core costs increased to 11.3% from 11.2% in 2017. Impairment charges relate to intangible assets of the sequencing business.

Diagnostics Division – General and administration

	2018 (CHF m)	2017 (CHF m)	% change (CER)
Administration	(549)	(532)	+3
Pensions – past service costs	11	6	+83
Gains (losses) on disposal of property, plant and equipment	0	(2)	–83
Business taxes and capital taxes	(8)	(1)	+415
Other general items	18	3	Over +500
General and administration – Core basis	**(528)**	**(526)**	**0**
Global restructuring plans	(38)	(27)	+39
Impairment of goodwill and intangible assets	(107)	(674)	–84
Mergers and acquisitions and alliance transactions	56	27	+107
Legal and environmental cases	(131)	(58)	+126
Pensions – settlement gains (losses)	0	(4)	–100
Total – IFRS basis	**(748)**	**(1,262)**	**–41**

Core costs remained stable compared to 2017, while there was a 3% increase in administration costs. The main drivers were higher personnel costs and integration expenses of recently acquired businesses, such as Viewics and mySugr. Business taxes in 2017 included an income from a settlement agreement for the Medical Device Excise Tax in the US. As a percentage of sales, core costs were 4.1%, a decrease of 0.3 percentage points. The impairment charges in 2017 were for the goodwill in the sequencing business. Legal expenses mainly arose from increasing litigation costs in the sequencing business.

Financial position

Diagnostics Division – Net operating assets

	2018 (CHF m)	2017 (CHF m)	% change (CHF)	% change (CER)	Movement: Transactions (CHF m)	Movement: CTA (CHF m)
Trade receivables	3,154	3,137	+1	+5	164	(147)
Inventories	2,336	2,280	+2	+7	142	(86)
Trade payables	(1,108)	(1,007)	+10	+13	(125)	24
Net trade working capital	**4,382**	**4,410**	**–1**	**+5**	**181**	**(209)**
Other receivables (payables)	(1,685)	(1,816)	–7	–6	107	24
Net working capital	**2,697**	**2,594**	**+4**	**+12**	**288**	**(185)**
Property, plant and equipment	6,413	6,431	0	+3	186	(204)
Goodwill and intangible assets	6,114	7,249	–16	–15	(1,107)	(28)
Provisions	(948)	(842)	+13	+14	(117)	11
Other long-term assets, net	46	11	+318	+294	35	0
Long-term net operating assets	**11,625**	**12,849**	**–10**	**–8**	**(1,003)**	**(221)**
Net operating assets	**14,322**	**15,443**	**–7**	**–5**	**(715)**	**(406)**

The absolute amount of the movement between the 2018 and 2017 consolidated balances reported in Swiss francs is split between actual 2018 transactions (translated at average rates for 2017) and the currency translation adjustment (CTA) that arises on consolidation. The 2018 transactions include non-cash movements and therefore the movements in this table are not the same as the amounts shown in the operating free cash flow (which only includes the cash movements). A full consolidated balance sheet is given on page 43 of the Annual Financial Statements, and a reconciliation between that balance sheet and the information given above is on page 161.

Currency translation effects on balance sheet amounts. Compared to the start of the year the Swiss franc appreciated against the euro, resulting in a negative translation impact on net operating assets. This was partly offset by the depreciation of the Swiss franc against the US dollar. The Diagnostics Division does not have a significant net asset position in Japanese yen and so the depreciation of the Swiss franc against the Japanese yen had only a minor impact. The exchange rates used are given on page 29.

Net working capital. Net working capital increased by 12% at CER. Trade receivables increased by 5% due to the growth in sales, notably in China and Japan. Inventories increased by 7% following the high demand in emerging markets driving higher purchases of instruments that are held in inventories prior to installation. Trade payables increased by 13% as a result of optimisation measures, including extending payment terms. The decrease in net liability for other receivables/payables was due to increases in prepayments and settlement of significant year-end accounts payable and accruals.

Long-term net operating assets. Overall long-term net operating assets decreased by 8% at CER, mainly triggered by the 15% decrease in goodwill and intangible assets as a result of the impairment charges. There was an increase of provisions for restructuring and litigation cases. Capital expenditure related to instrument placements and manufacturing site developments in China and Germany.

Free cash flow

Diagnostics Division – Operating free cash flow

	2018 (CHF m)	2017 (CHF m)	% change (CHF)	% change (CER)
Operating profit	**617**	**304**	**+103**	**+115**
– Depreciation, amortisation and impairment	2,217	2,339	–5	–5
– Provisions	116	12	Over +500	Over +500
– Equity compensation plans	78	73	+7	+7
– Other	281	204	+38	+37
Operating profit cash adjustments	**2,692**	**2,628**	**+2**	**+2**
Operating profit, net of operating cash adjustments	**3,309**	**2,932**	**+13**	**+14**
(Increase) decrease in net working capital	(511)	118	–	–
Investments in property, plant and equipment	(1,379)	(1,444)	–5	–5
Investments in intangible assets	(3)	(53)	–94	–95
Operating free cash flow	**1,416**	**1,553**	**–9**	**–8**
– as % of sales	11.0	12.9	–1.9	–1.8

For the definition of free cash flow and a detailed breakdown see pages 158–160.

The operating free cash flow of the Diagnostics Division was a net cash inflow of CHF 1,416 million, a decrease of 8% at CER compared to 2017. The cash generation of the business, measured by the operating profit, net of operating cash adjustments, increased by 14% compared with the core operating profit growth of 9%. This difference was in part due to higher cash proceeds from disposals and higher non-cash depreciation expenses in 2018. Net working capital increased and absorbed CHF 511 million of cash in 2018, which is due to the increases in trade receivables and inventories mentioned above in the 'Financial position' comments. Capital expenditure of CHF 1.4 billion was mainly due to instrument placements, notably in China and the US, and the manufacturing site development in China and Germany.

Corporate operating results

Corporate operating results summary

	2018 (CHF m)	2017 (CHF m)	% change (CER)
Administration	(454)	(454)	–1
Pensions – past service costs	1	0	–
Business taxes and capital taxes	(16)	(17)	–4
Other general items	(14)	(27)	–67
General and administration costs – Core basis[1]	**(483)**	**(498)**	**–4**
Global restructuring plans	(149)	(39)	+292
Mergers and acquisitions and alliance transactions	0	(1)	–69
Legal and environmental cases	(4)	(5)	–26
Total costs – IFRS basis	**(636)**	**(543)**	**+16**
Financial position			
Net working capital	(214)	(119)	+79
Long-term net operating assets	(44)	(178)	–76
Net operating assets	**(258)**	**(297)**	**–12**
Free cash flow[2]			
Operating free cash flow	(526)	(543)	–3

1) See pages 155–158 for the definition of core results.
2) See pages 158–160 for the definition of free cash flow and a detailed breakdown.

General and administration costs decreased by 4% at CER on a core basis due to lower project costs. Total costs on IFRS basis have increased by 16% due to restructuring in procurement, IT and several corporate functions. The change in net operating assets was mainly driven by organisational changes in IT resulting in a transfer of CHF 145 million of assets, mainly property, plant and equipment, from the Pharmaceuticals Division at the beginning of 2018. Net working capital was lower due to increased notes and accounts payable from the above-mentioned IT transfer. Corporate operating free cash flow includes restructuring activities and capital expenditure.

Foreign exchange impact on operating results

The Group's exposure to movements in foreign currencies affecting its operating results, as expressed in Swiss francs, is summarised by the following key figures and comments.

Growth (reported at CER and in CHF)

	% change (CER)		% change (CHF)	
	2018	2017	2018	2017
Pharmaceuticals Division				
Sales	+7	+5	+7	+5
Core operating profit	+8	+4	+8	+4
Diagnostics Division				
Sales	+7	+5	+7	+5
Core operating profit	+9	0	+7	–1
Group				
Sales	+7	+5	+7	+5
Core operating profit	+9	+3	+8	+3

Exchange rates against the Swiss franc

	31 December 2018	Average 2018	31 December 2017	Average 2017
1 USD	0.98	0.98	0.98	0.98
1 EUR	1.13	1.15	1.17	1.11
100 JPY	0.89	0.89	0.87	0.88

The results expressed in Swiss francs were negatively impacted by the appreciation of the Swiss franc against the US dollar and the Brazilian real, partly offset by the depreciation of the Swiss franc against the euro. The net impact on the results expressed in Swiss francs compared to constant exchange rates was negligible on sales and a 1 percentage point impact on core operating profit and on Core EPS. The sensitivity of Group sales and core operating profit to a 1% change in average foreign currency exchange rates against the Swiss franc during 2018 is shown in the table below.

Currency sensitivities

Impact of 1% increase in average exchange rate versus the Swiss franc	Sales (CHF m)	Core operating profit (CHF m)
US dollar	270	116
Euro	95	39
Japanese yen	42	28
All other currencies	145	77

The Group's revenues are primarily generated from sales of products to customers. Such revenues are mainly received in the local currency of the customer's home market, although in certain emerging markets invoicing is made in major international currencies such as the US dollar and euro. The costs of sales and marketing and also some administration costs follow the same currency pattern as sales. The majority of research and development activities are incurred at the Group's global research facilities, and therefore the costs are mainly concentrated in US dollars, Swiss francs and euros. General and administration costs tend to be incurred mainly at central locations in the US, Switzerland and Germany. Chugai's revenues and costs are denominated in Japanese yen.

Treasury and taxation results

Treasury and taxation results

	2018 (CHF m)	2017 (CHF m)	% change (CHF)	% change (CER)
IFRS results				
Operating profit	14,769	13,003	+14	+15
Financing costs	(770)	(839)	–8	–8
Other financial income (expense)	149	84	+77	+73
Profit before taxes	**14,148**	**12,248**	**+16**	**+17**
Income taxes	(3,283)	(3,423)	–4	–3
Net income	**10,865**	**8,825**	**+23**	**+24**
Attributable to				
– Roche shareholders	10,500	8,633	+22	+23
– Non-controlling interests	365	192	+90	+88
Core results[1]				
Operating profit	20,505	19,012	+8	+9
Financing costs	(744)	(819)	–9	–9
Other financial income (expense)	149	75	+99	+94
Profit before taxes	**19,910**	**18,268**	**+9**	**+10**
Income taxes	(3,929)	(4,864)	–19	–18
Net income	**15,981**	**13,404**	**+19**	**+20**
Attributable to				
– Roche shareholders	15,593	13,192	+18	+19
– Non-controlling interests	388	212	+83	+82
Financial position				
Net debt	(5,652)	(6,963)	–19	–19
Pensions	(6,140)	(6,620)	–7	–5
Income taxes	(89)	21	–	–
Financial non-current assets	570	557	+2	+2
Derivatives, net	(15)	(22)	–32	–28
Collateral, net	6	39	–85	–85
Interest payable	(221)	(218)	+1	+1
Other non-operating assets, net	156	108	+44	+45
Total net assets (liabilities)	**(11,385)**	**(13,098)**	**–13**	**–13**
Free cash flow[2]				
Treasury activities	(642)	(498)	+29	+32
Taxes paid	(3,288)	(3,909)	–16	–16
Total	**(3,930)**	**(4,407)**	**–11**	**–10**

1) See pages 155–158 for the definition of core results.
2) See pages 158–160 for the definition of free cash flow.

Financing costs

Core financing costs were CHF 744 million, a decrease of 9% at CER compared to 2017, with the decrease being mainly due to the base effect of losses on debt redemption of CHF 74 million in 2017. Interest expenses (including amortisation of debt discounts and issue costs) increased by 2% at CER to CHF 605 million due to increasing US interest rates. The net interest cost of defined benefit pension plans decreased by 7% at CER to CHF 139 million due to lower discount rates in the US at the end of 2017. A full analysis of financing costs is given in Note 4 to the Annual Financial Statements and details of the debt repayments and redemptions are given in Note 21.

Other financial income (expense)

Core other financial income (expense) was a net income of CHF 149 million compared to a net income of CHF 75 million in 2017. Net income from equity investments was CHF 311 million, with higher gains on equity investments in 2018. The net foreign exchange results, which reflect hedging costs and losses on unhedged positions, were losses of CHF 160 million compared to net losses of CHF 115 million in 2017. A full analysis of other financial income (expense) is given in Note 4 to the Annual Financial Statements.

Income taxes

The Group's effective core tax rate decreased by 6.9 percentage points to 19.7% in 2018. This was largely due to the impact from the US tax reform which reduced the effective core tax rate by more than 7 percentage points.

The IFRS results show a decrease in the effective tax rate of 4.7 percentage points to 23.2%. The US tax reform had a transitional impact on the 2017 results from the initial estimate of the effect on deferred tax balances of the tax rate changes. A true-up adjustment of this transitional effect was included in the 2018 non-core results. The IFRS results also included the impairment of goodwill, which was not tax deductible, hence the net effect in the 'Goodwill and intangible assets' line in the table below.

Further details of the Group's income tax expenses and related balance sheet positions are given in Note 5 to the Annual Financial Statements.

Analysis of the Group's effective tax rate

	2018			2017		
	Profit before tax (CHF m)	Income taxes (CHF m)	Tax rate (%)	Profit before tax (CHF m)	Income taxes (CHF m)	Tax rate (%)
Group's effective tax rate – Core basis	**19,910**	**(3,929)**	**19.7**	**18,268**	**(4,864)**	**26.6**
Global restructuring plans	(909)	150	16.5	(1,210)	248	20.5
Goodwill and intangible assets	(4,630)	413	8.9	(5,209)	1,380	26.5
Mergers and acquisitions and alliance transactions	(50)	29	58.0	345	2	–0.6
Legal and environmental cases	(168)	37	22.0	76	(46)	60.5
Pension plan settlements	(5)	1	20.0	(22)	4	18.2
Transitional effect of changes in US tax rates	–	35	–	–	(116)	–
Normalisation of equity compensation plan tax benefit	–	(19)	–	–	(31)	–
Group's effective tax rate – IFRS basis	**14,148**	**(3,283)**	**23.2**	**12,248**	**(3,423)**	**27.9**

Financial position

The decrease in net debt was due to the free cash flow of CHF 14.8 billion, partly offset by the dividend payments of CHF 7.3 billion, the payments for mergers and acquisitions of CHF 3.4 billion and the buy-out of the minority owners of Foundation Medicine of CHF 2.3 billion. The net pension liability decreased by CHF 0.5 billion to CHF 6.1 billion due to an increase in discount rates in the US, Switzerland and Germany, partially offset by a decrease in the fair value of plan assets in Switzerland and the US. The net tax liabilities increased mainly due to the deferred tax effects from the net pension liabilities. At 31 December 2018 the Group held financial long-term assets with a market value of CHF 0.7 billion, which consist mostly of holdings in biotechnology and other pharmaceuticals companies which were acquired as part of licensing transactions or scientific collaborations.

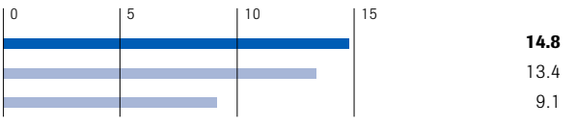
Free cash flow

The cash outflow from treasury activities increased to CHF 0.6 billion due to higher pension contributions in 2018, partly offset by higher proceeds from sales of equity investments. Total taxes paid decreased by 16% to CHF 3.3 billion due to lower income tax payments in the US following the US tax reform partly offset by the timing of tax payments.

Cash flows and net debt

Operating free cash flow in billions of CHF

Free cash flow in billions of CHF



Free cash flow in millions of CHF

	Pharmaceuticals	Diagnostics	Corporate	Group
2018				
Operating profit – IFRS basis	14,788	617	(636)	14,769
Operating profit cash adjustments	5,906	2,692	120	8,718
Operating profit, net of operating cash adjustments	**20,694**	**3,309**	**(516)**	**23,487**
(Increase) decrease in net working capital	617	(511)	70	176
Investments in property, plant and equipment	(2,584)	(1,379)	(80)	(4,043)
Investments in intangible assets	(876)	(3)	0	(879)
Operating free cash flow	**17,851**	**1,416**	**(526)**	**18,741**
Treasury activities				(642)
Taxes paid				(3,288)
Free cash flow				**14,811**
2017				
Operating profit – IFRS basis	13,242	304	(543)	13,003
Operating profit cash adjustments	5,990	2,628	(8)	8,610
Operating profit, net of operating cash adjustments	**19,232**	**2,932**	**(551)**	**21,613**
(Increase) decrease in net working capital	297	118	12	427
Investments in property, plant and equipment	(2,061)	(1,444)	(4)	(3,509)
Investments in intangible assets	(651)	(53)	0	(704)
Operating free cash flow	**16,817**	**1,553**	**(543)**	**17,827**
Treasury activities				(498)
Taxes paid				(3,909)
Free cash flow				**13,420**

For the definition of free cash flow and a detailed breakdown see pages 158–160.

Operating free cash flow increased by 5% at CER to CHF 18.7 billion. The major factor in this increase was the growth in the underlying cash generated from operations, which was CHF 23.5 billion, as cash revenues grew more than cash expenses. There was a smaller decrease in net working capital compared to 2017. This was mainly due to the lower increase in accounts payable in 2018. Capital expenditure was CHF 4.0 billion, driven by site development in Basel and South San Francisco, as well as the land purchase in Yokohama, Japan, for new research facilities. Investments in intangible assets were CHF 0.9 billion, an increase of CHF 0.2 billion compared to 2017 coming from increased in-licensing activities in the Pharmaceuticals Division.

The net cash outflow from treasury activities increased to CHF 0.6 billion due to higher pension contributions. This was partly offset by higher proceeds from sales of equity investments in 2018. Taxes paid were 16% lower at CHF 3.3 billion due to lower tax payments in the US following the US tax reform, partially offset by the timing of tax payments. The free cash flow of CHF 14.8 billion was 11% higher than in 2017, as a result of the higher operating free cash flow and lower income tax payments.

Net debt in millions of CHF

At 1 January 2018	
Cash and cash equivalents	4,719
Marketable securities	7,278
Long-term debt	(15,839)
Short-term debt	(3,121)
Net debt at beginning of period	**(6,963)**
Change in net debt during 2018	
Free cash flow	14,811
Dividend payments	(7,253)
Transactions in own equity instruments	(448)
Mergers and acquisitions, net of divestments of subsidiaries	(3,420)
Hedging and collateral arrangements	12
Changes in ownership interests in subsidiaries	(2,287)
Currency translation, fair value and other movements	(104)
Change in net debt	**1,311**
At 31 December 2018	
Cash and cash equivalents	6,681
Marketable securities	6,437
Long-term debt	(16,077)
Short-term debt	(2,693)
Net debt at end of period	**(5,652)**

For the definition of net debt see page 162.

Net debt – currency profile in millions of CHF

	Cash and marketable securities		Debt	
	2018	2017	2018	2017
US dollar [1]	2,598	1,935	(14,169)	(12,973)
Euro	4,553	4,422	(1,855)	(3,109)
Swiss franc	3,106	2,751	(2,504)	(2,599)
Japanese yen	2,214	2,057	(2)	(3)
Pound sterling	140	278	(95)	(100)
Other	507	554	(145)	(176)
Total	**13,118**	**11,997**	**(18,770)**	**(18,960)**

1) US dollar-denominated debt includes those bonds and notes denominated in euros that were swapped into US dollars, and therefore in the consolidated results they have economic characteristics equivalent to US dollar-denominated bonds and notes.

The net debt position of the Group at 31 December 2018 was CHF 5.7 billion, a decrease of CHF 1.3 billion from 31 December 2017. The decrease in 2018 was due to the strong free cash flow of CHF 14.8 billion, partly offset by the annual dividend payments of CHF 7.3 billion, the payments for the Ignyta and Flatiron Health and other acquisitions of CHF 3.4 billion, as well as the payments of CHF 2.3 billion for taking full ownership of Foundation Medicine.

The issuance, redemption and repurchase of bonds and notes during 2018 (see Note 21 to the Annual Financial Statements) had an impact on liquid funds, but had no impact on the net debt position.

Contractual obligations and commitments

The Group has obligations and commitments, as set out in the table below. Carrying values are as shown in the consolidated balance sheet. The potential obligations shown are not discounted and are not risk-adjusted. Any amounts denominated in foreign currencies are translated into Swiss francs at the 31 December 2018 exchange rates.

Contractual obligations and commitments as at 31 December 2018 in millions of CHF

	Potential obligation (undiscounted)					
	Less than 1 year	1–2 years	2–5 years	Over 5 years	Total	Carrying value
On-balance sheet						
Debt [21]						
– Bonds and notes	2,469	1,068	6,402	12,750	22,689	18,041
– Other debt	726	1	2	0	729	729
Contingent consideration provisions [20, 30]	287	30	401	291	1,009	511
Accounts payable [17]	3,526	0	0	0	3,526	3,526
Derivative financial instruments [19]	64	11	78	0	153	153
Unfunded defined benefit plans [26]	172	174	562	6,399	7,307	5,020
Total on-balance sheet commitments	**7,244**	**1,284**	**7,445**	**19,440**	**35,413**	**27,980**
Off-balance sheet						
Capital commitments for property, plant and equipment [8]	839	183	322	5	1,349	0
Operating leases [8]	364	286	464	216	1,330	0
Contract manufacturing commitments [30]	345	306	626	166	1,443	0
Alliance collaboration commitments [10]	398	585	778	262	2,023	0
Total off-balance sheet commitments	**1,946**	**1,360**	**2,190**	**649**	**6,145**	**0**
Total contractual commitments	**9,190**	**2,644**	**9,635**	**20,089**	**41,558**	**27,980**

References are to the Notes in the Annual Financial Statements.

Debt. This consists mainly of bonds and notes and includes the principal and interest on the Group's debt instruments. Other debt is mainly commercial paper. The carrying values are discounted based on the interest rates inherent in the instruments.

Contingent consideration provisions. These are potential payments arising from mergers and acquisitions. The carrying values are risk-adjusted and discounted.

Unfunded defined benefit plans. These are mainly the pension plans in the Group's German affiliates, where the fully reserved pension obligations are used for self-financing of the local affiliates' operations. The carrying values are discounted. Future company contributions to the Group's funded plans are not shown in the above table.

Capital commitments for property, plant and equipment. These are non-cancellable commitments for the purchase and construction mainly at the Roche sites in Basel (Switzerland) and South San Francisco (US).

Operating leases. These are the future obligations under non-cancellable lease contracts. In 2019 the Group will implement IFRS 16 'Leases' and at that point these obligations will be reported in the balance sheet.

Contract manufacturing commitments. These are the future minimum take-or-pay commitments to purchase inventories arising from the Group's major long-term agreements with external Contract Manufacturing Organisations ('CMOs').

Alliance collaboration commitments. These are potential upfront and milestone payments that may become due from the Group's in-licensing arrangements. Potential payments to alliance partners and for asset deals within the next three years are included assuming all projects currently in development are successful. Potential payments beyond three years are only included for asset deals.

Provisions for legal and environmental matters. These are not included in the above table as the timing and amount of any cash outflow is uncertain and contingent on the development of the matters in question.

Pensions and other post-employment benefits

Post-employment benefit plans are classified for IFRS as 'defined contribution plans' if the Group pays fixed contributions into a separate fund or to a third-party financial institution and will have no further legal or constructive obligation to pay further contributions. In 2018 expenses for the Group's defined contribution plans were CHF 419 million (2017: CHF 482 million). All other plans are classified as 'defined benefit plans', even if the Group's potential obligation is minor or has a relatively remote possibility of arising. Plans are usually established as trusts which are independent of the Group and are funded by payments from the Group and by employees, but in some cases the plan is unfunded and the Group pays pensions to retired employees directly from its own financial resources. In 2018 expenses for the Group's defined benefit plans were CHF 657 million (2017: CHF 658 million).

Defined benefit plans

Funding status and balance sheet position

	2018 (CHF m)	2017 (CHF m)
Funded plans		
– Fair value of plan assets	15,264	14,356
– Defined benefit obligation	(16,500)	(15,705)
Over (under) funding	**(1,236)**	**(1,349)**
Unfunded plans		
– Defined benefit obligation	(5,020)	(5,411)
Total funding status	**(6,256)**	**(6,760)**
Limit on asset recognition	(2)	0
Reimbursement rights	118	140
Net recognised asset (liability)	**(6,140)**	**(6,620)**

Overall the funding status on an IFRS basis of the Group's funded defined benefit plans increased to 93% compared to 91% at the start of the year. This came from the plans in the US and Switzerland, with an increase in the discount rates being partially offset by decreases in the fair value of plan assets since the end of 2017. In addition both plan assets and defined benefit obligation of funded plans increased by CHF 1.1 billion following a plan change in Switzerland. The funded status of the pension funds is monitored by the local pension fund governance bodies as well as being closely reviewed at a Group level. The total cash outflow from the Group's defined benefit plans in 2018 was CHF 0.8 billion compared to CHF 0.5 billion in 2017. There were higher additional contributions paid into the Group's pension plans in the US in 2018.

The unfunded plans are mainly those in the Group's German affiliates, where the fully reserved pension obligations are used for self-financing of the local affiliates' operations. The unfunded liabilities for these plans decreased during 2018 mainly due to a higher discount rate in Germany.

Full details of the Group's pensions and other post-employment benefits are given in Note 26 to the Annual Financial Statements.

Roche shares

Share price and market capitalisation (at 31 December)

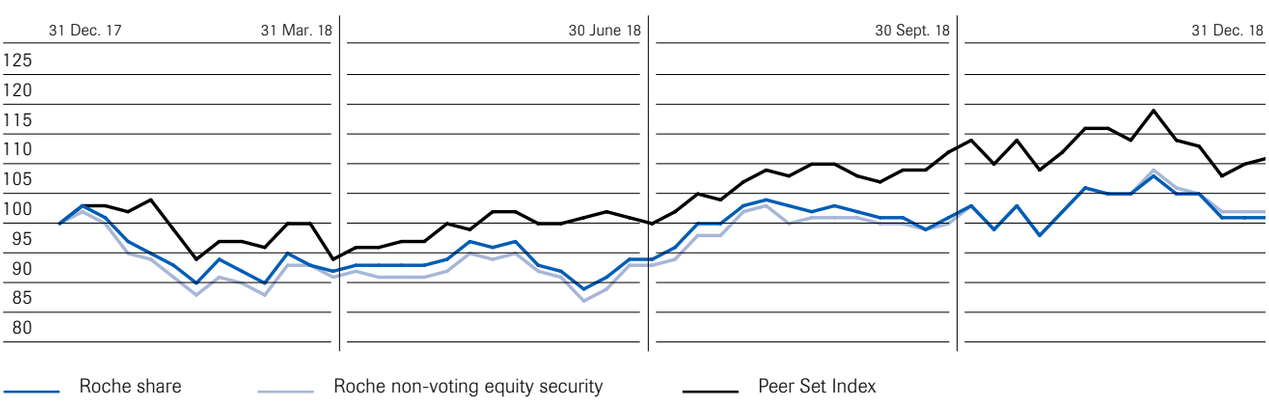
	2018	2017	% change (CHF)
Share price (CHF)	239.40	246.20	–3
Non-voting equity security *(Genussschein)* price (CHF)	243.40	246.50	–1
Market capitalisation (billions of CHF)	207	210	–1

In 2018 Roche ranked number 11 among a peer group consisting of Roche and 15 other healthcare companies[1)] for Total Shareholder Return (TSR), defined as share price growth plus dividends, measured in Swiss francs at actual exchange rates. At constant exchange rates (CER) Roche ranked number 10, with the year-end return being +1% for Roche shares and +2% for Roche non-voting equity securities. The combined performance of share and non-voting equity security was +2% compared to a weighted average return for the peer group of +11% in CHF terms and at CER.

In 2018 the healthcare sector outperformed world equity markets, which were characterised by increased volatility in the second half of the year. Although the Swiss Market Index (SMI) posted losses in 2018, performance was mixed relative to other major global indices, with the SMI underperforming major US indices but outperforming European indices. The Roche share performance continued to be impacted by uncertainty over the impact of biosimilars in the US and concerns around US pricing reforms, despite the positive news flow over the year and a strong late-stage pipeline.

1) Peer group for 2018: Abbott, AbbVie, Amgen, Astellas, AstraZeneca, Bayer, Bristol-Myers Squibb, GlaxoSmithKline, Johnson & Johnson, Lilly, Merck & Co., Novartis, Pfizer, Roche, Sanofi and Takeda.

Total Shareholder Return development



Source: Datastream. Data for Roche and the peer index has been re-based to 100 at 1 January 2018. The Peer Index was converted into Swiss francs at daily actual exchange rates. Currency fluctuations have an influence on the representation of the relative performance of Roche versus the peer index.

Proposed dividend

The Board of Directors is proposing an increase of 5% in the dividend for 2018 to CHF 8.70 per share and non-voting equity security (2017: CHF 8.30) for approval at the Annual General Meeting. This would be the 32nd consecutive increase in the dividend. If the dividend proposal is approved by shareholders, dividend payments on the total shares and non-voting equity securities will amount to CHF 7.5 billion (2017: CHF 7.2 billion), resulting in a pay-out ratio (based on core net income) of 48.0% (2017: 54.1%). Based on the prices at year-end 2018, the dividend yield on the Roche share was 3.6% (2017: 3.4%) and the yield on the non-voting equity security was also 3.6% (2017: 3.4%). Further information on the Roche securities is given on pages 163 to 164.

Information per share and non-voting equity security

	2018 (CHF)	2017 (CHF)	% change (CHF)
EPS – Basic	12.29	10.12	+21
EPS – Diluted	12.21	10.04	+22
Core EPS – Basic	18.25	15.47	+18
Core EPS – Diluted	18.14	15.34	+18
Equity attributable to Roche shareholders per share	32.33	30.97	+4
Dividend per share	8.70	8.30	+5

For further details please refer to Notes 22 and 28 of the Annual Financial Statements and page 158. The pay-out ratio is calculated as dividend per share divided by core earnings per share.

Debt

Debt redemptions. During 2018 there were the following redemptions:
- On the due date of 25 June 2018 of EUR 1.0 billion of bonds.
- On the due date of 21 September 2018 of CHF 0.6 billion of bonds.
- On the due date of 23 September 2018 of CHF 0.4 billion of bonds.

Debt issuances. During 2018 there were the following issuances:
- On 17 September 2018 the Group issued USD 750 million of bonds due on 17 September 2023 and USD 650 million of bonds due on 17 September 2028.
- On 24 September 2018 the Group issued CHF 500 million of bonds due on 24 September 2025 and CHF 400 million of bonds due on 24 September 2030.

All the above transactions are further described in Note 21 to the Annual Financial Statements.

The maturity schedule of the Group's bonds and notes outstanding at 31 December 2018 is shown in the table below.

Bonds and notes: nominal amounts at 31 December 2018 by contractual maturity

	US dollar (USD m)	Euro (EUR m)	Pound sterling (GBP m)	Swiss franc (CHF m)	Total[1] (USD m)	Total[1] (CHF m)
2019	2,000	–	–	–	2,000	1,969
2020	600	–	–	–	600	591
2021	1,300	1,140[2]	–	–	2,604	2,563
2022	650	–	–	500	1,158	1,140
2023	750	650	77	–	1,591	1,566
2024–2028	5,150	1,000	–	1,250	7,564	7,445
2029 and beyond	2,164	–	–	750	2,926	2,880
Total	**12,614**	**2,790**	**77**	**2,500**	**18,443**	**18,154**

1) Total translated at 31 December 2018 exchange rates.
2) Of the proceeds from these bonds and notes, EUR 850 million has been swapped into US dollars, and therefore in the consolidated results these bonds and notes have economic characteristics equivalent to US dollar-denominated bonds and notes.

The Group plans to meet its debt obligations using existing liquid funds as well as cash generated from business operations. In 2018 the free cash flow was CHF 14.8 billion, which included the cash generated from operations, as well as payment of interest and tax.

For short-term financing requirements, the Group has a commercial paper program in the US under which it can issue up to USD 7.5 billion of unsecured commercial paper notes and has committed credit lines of USD 7.5 billion available as back-stop lines. Commercial paper notes totalling USD 0.6 billion were outstanding as of 31 December 2018 (2017: USD 0.8 billion). For longer-term financing the Group maintains strong long-term investment-grade credit ratings of AA by Standard & Poor's and Aa3 by Moody's which should facilitate efficient access to international capital markets.

Further information on the Group's debt is given in Note 21 to the Annual Financial Statements.

Financial risks

At 31 December 2018 the Group has a net debt position of CHF 5.7 billion (2017: CHF 7.0 billion). The financial assets of the Group are managed in a conservative way with the objective to meet the Group's financial obligations at all times.

Asset allocation. A considerable portion of the cash and marketable securities the Group currently holds is being used for debt redemptions. Liquid funds are either held as cash or are invested in high-quality, investment-grade fixed income securities with an investment horizon to meet those liquidity requirements.

Cash and marketable securities

	2018		2017	
	(CHF m)	(% of total)	(CHF m)	(% of total)
Cash and cash equivalents	6,681	51	4,719	39
Money market instruments	5,381	41	6,107	51
Debt securities	1,047	8	1,161	10
Equity securities	9	0	10	0
Total cash and marketable securities	**13,118**	**100**	**11,997**	**100**

Credit risk. Credit risk arises from the possibility that counterparties to transactions may default on their obligations causing financial losses for the Group. The rating profile of the Group's CHF 13.1 billion of cash and fixed income marketable securities remained strong with 93% being invested in the A-AAA range. The Group has signed netting and collateral agreements with the counterparties in order to mitigate counterparty risk on derivative positions.

The Group has trade receivables of CHF 10.7 billion. Since the beginning of 2010 there have been financial difficulties in Southern European countries, notably Spain, Italy, Greece and Portugal. The Group is a leading supplier to the healthcare sectors in these countries and at 31 December 2018 has trade receivables of EUR 0.5 billion (CHF 0.5 billion) with public customers in these countries. This is a decrease of 11% compared to 31 December 2017 in euro terms. The Group uses different measures to improve collections in these countries, including intense communication with customers, factoring, negotiations of payment plans, charging of interest for late payments, and legal actions. Since 2011 the Group's trade receivables balance in Southern Europe has decreased by 64% in euro terms.

Liquidity risk. Liquidity risk arises through a surplus of financial obligations over available financial assets due at any point in time. The Group's approach to liquidity risk is to maintain sufficient readily available reserves in order to meet its liquidity requirements at any point in time. In addition to the current liquidity position, the Group has strong cash generation ability. Those future cash flows will be used to repay debt instruments in the coming years.

Roche enjoys strong long-term investment-grade credit ratings of AA by Standard & Poor's and Aa3 by Moody's. At the same time Roche is rated at the highest available short-term ratings by those agencies. On 8 February 2018 Moody's upgraded Roche's rating from A1 to Aa3. In the event of financing requirements, the ratings and the strong credit of Roche should permit efficient access to international capital markets, including the commercial paper market. The Group has committed credit lines with various financial institutions totalling USD 7.5 billion available as back-stop lines for the commercial paper program. As at 31 December 2018 no debt has been drawn under these credit lines.

Market risk. Market risk arises from changing market prices of the Group's financial assets or financial liabilities. The exposures are predominantly related to changes in interest rates, foreign exchange rates and equity prices. The Group uses Value-at-Risk (VaR) to assess the impact of market risk on its financial instruments. VaR data indicates the value range within which a given financial instrument will fluctuate with a pre-set probability as a result of movements in market prices. The Group's VaR remained stable during 2018.

Interest rate risk. Interest rate risk arises from movements in interest rates which could affect the Group's financial result or the value of the Group equity. The Group may use interest rate derivatives to manage its interest rate-related exposure and financial result.

Further information on financial risk management and financial risks and the VaR methodology is included in Note 30 to the Annual Financial Statements.

International Financial Reporting Standards

The Roche Group has been using International Financial Reporting Standards (IFRS) to report its consolidated results since 1990. In 2018 the Group implemented IFRS 9 'Financial Instruments' and IFRS 15 'Revenues from Contracts with Customers', including any consequential amendments to other standards. The Group has also implemented various minor amendments to existing standards and interpretations, which have no material impact on the Group's overall results and financial position.

New and revised standards applied in 2018

IFRS 9 'Financial Instruments'. The Group has implemented the new standard effective 1 January 2018 and has applied the exemption from full retrospective application for the classification and measurement requirements, including impairment, meaning that the comparative 2017 results have not been restated. The standard deals with the classification, recognition and measurement (including impairment) of financial instruments, the impairment of financial assets, including trade and lease receivables, and also introduces a new hedge accounting model.

IFRS 15 'Revenues from Contracts with Customers'. The Group has implemented the new standard effective 1 January 2018 and has applied the full retrospective method for the transition. Since the new standard does not change the amounts of revenue recognised for 2017, no restatements of the comparative 2017 results were necessary. The new standard contains a new set of principles on when and how to recognise and measure revenue as well as new requirements related to presentation. The core principle in that framework is that revenue should be recognised dependent on the transfer of promised goods or services to the customer for an amount that reflects the consideration which should be received in exchange for those goods or services.

IFRS 3 'Business Combinations'. In October 2018 the International Accounting Standards Board issued amendments to IFRS 3 'Business Combinations'. The amendments further clarify the definition of a business and add a 'concentration test' to aid the assessment of whether a transaction represents a business combination or simply in substance the purchase of a single asset or group of similar assets. These amendments are mandatory from 2020 and may be early adopted. The effect of the amendments is particularly applicable for many of the acquisitions carried out by the Roche Group, since the value in the acquired companies often consists of the rights to a single product or technology. Therefore, effective 1 January 2018, the Group has early implemented these amendments, with prospective application and with no restatement of comparative period information. The reassessment of the cash-generating units used for allocating goodwill in the Pharmaceuticals Division that was detailed above in the section on 'Impairment of goodwill and intangible assets', and the resulting impairment entries recorded, aligns historic transactions with transactions from 2018 onwards, which will use the revised IFRS 3 definition of a business.

As a result of the amendments to IFRS 3, the acquisition of Ignyta has been reassessed and accounted for as an asset acquisition in the 2018 Annual Financial Statements rather than as a business combination as disclosed in the 2018 Interim Financial Statements. This led to a decrease in goodwill of CHF 0.3 billion, a decrease in intangible assets of CHF 0.1 billion and a decrease in deferred tax liabilities of CHF 0.4 billion. Apart from this, none of these new standards have a material impact on the Group's overall results and financial position. As a result of implementing IFRS 15, the Group has also made a presentational change to the income statement to include a subtotal 'Revenue', and has created a new note for 'Revenue' as Note 3.

See Note 33 to the Annual Financial Statements for further details of these matters.

New and revised standards that will be applied in 2019 and beyond

IFRS 16 'Leases'. The Group will implement the new standard effective 1 January 2019 and will apply the cumulative catch-up method option for the transition, meaning that the comparative 2018 results will not be restated when the new standard is applied. The main impact of the new standard will be to bring operating leases on-balance sheet. The Group currently anticipates that the new standard will result in the carrying value of leased assets being increased by approximately CHF 1.2 billion, with lease liabilities increased by a similar amount at the date of implementation. The application of the new standard will result in part of what is currently reported as operating lease costs being recorded as interest expenses. Given the leases involved and the prevailing low interest rate environment the Group does not currently expect this effect to be material.

See Note 33 to the Annual Financial Statements for further details.

Roche Group
Consolidated Financial Statements

Roche Group consolidated income statement for the year ended 31 December 2018 in millions of CHF

	Pharmaceuticals	Diagnostics	Corporate	Group
Sales [2, 3]	43,967	12,879	–	56,846
Royalties and other operating income [2, 3]	2,553	98	–	2,651
Revenue [2, 3]	**46,520**	**12,977**	**–**	**59,497**
Cost of sales	(10,491)	(6,778)	–	(17,269)
Marketing and distribution	(7,068)	(3,041)	–	(10,109)
Research and development [2]	(10,299)	(1,793)	–	(12,092)
General and administration	(3,874)	(748)	(636)	(5,258)
Operating profit [2]	**14,788**	**617**	**(636)**	**14,769**
Financing costs [4]				(770)
Other financial income (expense) [4]				149
Profit before taxes				**14,148**
Income taxes [5]				(3,283)
Net income				**10,865**
Attributable to				
– Roche shareholders [22]				10,500
– Non-controlling interests [24]				365
Earnings per share and non-voting equity security [28]				
Basic (CHF)				12.29
Diluted (CHF)				12.21

Roche Group consolidated income statement for the year ended 31 December 2017 in millions of CHF

	Pharmaceuticals	Diagnostics	Corporate	Group
Sales [2, 3]	41,220	12,079	–	53,299
Royalties and other operating income [2, 3]	2,284	163	–	2,447
Revenue [2, 3]	**43,504**	**12,242**	**–**	**55,746**
Cost of sales	(11,978)	(6,201)	–	(18,179)
Marketing and distribution	(6,960)	(2,887)	–	(9,847)
Research and development [2]	(9,704)	(1,588)	–	(11,292)
General and administration	(1,620)	(1,262)	(543)	(3,425)
Operating profit [2]	**13,242**	**304**	**(543)**	**13,003**
Financing costs [4]				(839)
Other financial income (expense) [4]				84
Profit before taxes				**12,248**
Income taxes [5]				(3,423)
Net income				**8,825**
Attributable to				
– Roche shareholders [22]				8,633
– Non-controlling interests [24]				192
Earnings per share and non-voting equity security [28]				
Basic (CHF)				10.12
Diluted (CHF)				10.04

Roche Group consolidated statement of comprehensive income in millions of CHF

	Year ended 31 December	
	2018	2017
Net income recognised in income statement	**10,865**	**8,825**
Other comprehensive income (OCI)		
Remeasurements of defined benefit plans [22]	134	404
Fair value changes on equity investments at fair value through OCI [22]	87	n/a
Items that will never be reclassified to the income statement	**221**	**404**
Available-for-sale investments [22]	n/a	(22)
Fair value changes on debt securities at fair value through OCI [22]	(7)	n/a
Cash flow hedges [22]	(15)	(11)
Currency translation of foreign operations [22]	(290)	362
Items that are or may be reclassified to the income statement	**(312)**	**329**
Other comprehensive income, net of tax	**(91)**	**733**
Total comprehensive income	**10,774**	**9,558**
Attributable to		
– Roche shareholders [22]	10,364	9,390
– Non-controlling interests [24]	410	168
Total	**10,774**	**9,558**

The statement of comprehensive income has been adjusted to reflect the presentational changes required as a result from implementing IFRS 9 'Financial Instruments' as described in Note 33.

Roche Group consolidated balance sheet in millions of CHF

	31 December 2018	31 December 2017	31 December 2016
Non-current assets			
Property, plant and equipment [8]	21,818	20,912	19,957
Goodwill [9]	8,948	10,077	11,282
Intangible assets [10]	9,346	8,368	12,046
Deferred tax assets [5]	3,895	3,576	2,826
Defined benefit plan assets [26]	877	801	738
Other non-current assets [15]	1,389	1,370	1,300
Total non-current assets	**46,273**	**45,104**	**48,149**
Current assets			
Inventories [11]	6,621	7,407	7,928
Accounts receivable [12]	9,776	9,577	8,760
Current income tax assets [5]	208	348	335
Other current assets [16]	2,521	2,243	2,540
Marketable securities [13]	6,437	7,278	4,944
Cash and cash equivalents [14]	6,681	4,719	4,163
Total current assets	**32,244**	**31,572**	**28,670**
Total assets	**78,517**	**76,676**	**76,819**
Non-current liabilities			
Long-term debt [21]	(16,077)	(15,839)	(16,992)
Deferred tax liabilities [5]	(384)	(495)	(838)
Defined benefit plan liabilities [26]	(7,017)	(7,421)	(7,678)
Provisions [20]	(1,452)	(1,548)	(1,777)
Other non-current liabilities [18]	(188)	(206)	(532)
Total non-current liabilities	**(25,118)**	**(25,509)**	**(27,817)**
Current liabilities			
Short-term debt [21]	(2,693)	(3,121)	(5,363)
Current income tax liabilities [5]	(3,808)	(3,408)	(2,713)
Provisions [20]	(2,329)	(2,042)	(2,271)
Accounts payable [17]	(3,526)	(3,454)	(3,375)
Other current liabilities [19]	(10,677)	(10,135)	(8,878)
Total current liabilities	**(23,033)**	**(22,160)**	**(22,600)**
Total liabilities	**(48,151)**	**(47,669)**	**(50,417)**
Total net assets	**30,366**	**29,007**	**26,402**
Equity			
Capital and reserves attributable to Roche shareholders [22]	27,622	26,441	23,911
Equity attributable to non-controlling interests [24]	2,744	2,566	2,491
Total equity	**30,366**	**29,007**	**26,402**

Roche Group consolidated statement of cash flows in millions of CHF

	Year ended 31 December	
	2018	2017
Cash flows from operating activities		
Cash generated from operations [29]	24,424	22,256
(Increase) decrease in net working capital	176	427
Payments made for defined benefit plans [26]	(785)	(538)
Utilisation of provisions [20]	(883)	(621)
Disposal of products	335	410
Other operating cash flows	0	(1)
Income taxes paid	(3,288)	(3,909)
Total cash flows from operating activities	**19,979**	**18,024**
Cash flows from investing activities		
Purchase of property, plant and equipment	(4,043)	(3,509)
Purchase of intangible assets	(879)	(704)
Disposal of property, plant and equipment	146	100
Disposal of intangible assets	0	0
Business combinations [6]	(1,550)	(280)
Asset acquisitions [6]	(1,824)	–
Divestment of subsidiaries [23]	1	11
Interest and dividends received [29]	24	30
Sales of equity securities and debt securities	566	762
Purchases of equity securities and debt securities	(412)	(319)
Sales (purchases) of money market instruments and time accounts over three months, net	672	(2,612)
Other investing cash flows	104	62
Total cash flows from investing activities	**(7,195)**	**(6,459)**
Cash flows from financing activities		
Proceeds from issue of bonds and notes [21]	2,252	1,502
Redemption and repurchase of bonds and notes [21]	(2,152)	(3,068)
Increase (decrease) in commercial paper [21]	(199)	(1,258)
Increase (decrease) in other debt [21]	(23)	(385)
Hedging and collateral arrangements	12	235
Changes in ownership interest in subsidiaries [6]	(2,287)	–
Equity contribution by non-controlling interests	0	5
Interest paid	(593)	(648)
Dividends paid [29]	(7,253)	(7,140)
Equity-settled equity compensation plans, net of transactions in own equity [27]	(448)	(358)
Other financing cash flows	0	0
Total cash flows from financing activities	**(10,691)**	**(11,115)**
Net effect of currency translation on cash and cash equivalents	(131)	106
Increase (decrease) in cash and cash equivalents	**1,962**	**556**
Cash and cash equivalents at 1 January	4,719	4,163
Cash and cash equivalents at 31 December [14]	**6,681**	**4,719**

Roche Group consolidated statement of changes in equity in millions of CHF

	Share capital	Retained earnings	Fair value reserves	Hedging reserves	Translation reserves	Total	Non-controlling interests	Total equity
Year ended 31 December 2017								
At 1 January 2017	**160**	**31,092**	**185**	**63**	**(7,589)**	**23,911**	**2,491**	**26,402**
Net income recognised in income statement	–	8,633	–	–	–	8,633	192	8,825
Available-for-sale investments	–	–	(26)	–	–	(26)	4	(22)
Cash flow hedges	–	–	–	–	–	–	(11)	(11)
Currency translation of foreign operations	–	–	(1)	(2)	385	382	(20)	362
Remeasurements of defined benefit plans	–	401	–	–	–	401	3	404
Total comprehensive income	**–**	**9,034**	**(27)**	**(2)**	**385**	**9,390**	**168**	**9,558**
Dividends	–	(6,998)	–	–	–	(6,998)	(121)	(7,119)
Equity compensation plans, net of transactions in own equity	–	146	–	–	–	146	15	161
Changes in non-controlling interests [24]	–	(8)	–	–	–	(8)	8	–
Equity contribution by non-controlling interests [24]	–	–	–	–	–	–	5	5
At 31 December 2017	**160**	**33,266**	**158**	**61**	**(7,204)**	**26,441**	**2,566**	**29,007**
Year ended 31 December 2018								
At 1 January 2018	160	33,266	158	61	(7,204)	26,441	2,566	29,007
Implementation of IFRS 9 'Financial Instruments' [33]	–	105	(110)	–	–	(5)	0	(5)
At 1 January 2018 (revised)	**160**	**33,371**	**48**	**61**	**(7,204)**	**26,436**	**2,566**	**29,002**
Net income recognised in income statement	–	10,500	–	–	–	10,500	365	10,865
Net change in fair value – financial assets at fair value through OCI	–	100	(21)	–	–	79	1	80
Cash flow hedges	–	–	–	(14)	–	(14)	(1)	(15)
Currency translation of foreign operations	–	–	1	–	(344)	(343)	53	(290)
Remeasurements of defined benefit plans	–	142	–	–	–	142	(8)	134
Total comprehensive income	**–**	**10,742**	**(20)**	**(14)**	**(344)**	**10,364**	**410**	**10,774**
Dividends	–	(7,094)	–	–	–	(7,094)	(136)	(7,230)
Equity compensation plans, net of transactions in own equity	–	51	–	–	–	51	10	61
Changes in ownership interest in subsidiaries [6]	–	(2,129)	–	–	–	(2,129)	(112)	(2,241)
Changes in non-controlling interests [24]	–	(6)	–	–	–	(6)	6	–
Equity contribution by non-controlling interests [24]	–	–	–	–	–	–	0	0
At 31 December 2018	**160**	**34,935**	**28**	**47**	**(7,548)**	**27,622**	**2,744**	**30,366**

Equity as at 1 January 2018 has been revised following the implementation of IFRS 9 'Financial Instruments' as described in Note 33. In addition, the statement of changes in equity has been adjusted to reflect the presentational changes required by the implementation of this new standard.

Notes to the Roche Group Consolidated Financial Statements

1. General accounting principles

Basis of preparation

The consolidated financial statements (hereafter 'the Annual Financial Statements') of the Roche Group have been prepared in accordance with International Financial Reporting Standards (IFRS) and comply with Swiss law. They have been prepared using the historical cost convention except for items that are required to be accounted for at fair value. They were approved for issue by the Board of Directors on 28 January 2019 and are subject to approval by the Annual General Meeting of shareholders on 5 March 2019.

These financial statements are the Annual Financial Statements of Roche Holding Ltd, a company registered in Switzerland, and its subsidiaries ('the Group').

The Group's significant accounting policies and changes in accounting policies are disclosed in Note 33.

Key accounting judgements, estimates and assumptions

The preparation of the Annual Financial Statements requires management to make judgements, estimates and assumptions that affect the reported amounts of revenues, expenses, assets, liabilities and contingent amounts. Actual outcomes could differ from those management estimates. The estimates and underlying assumptions are reviewed on an ongoing basis and are based on historical experience and various other factors. Revisions to estimates are recognised in the period in which the estimate is revised. The following are considered to be the key accounting judgements, estimates and assumptions made and are believed to be appropriate based upon currently available information.

Revenue. The nature of the Group's business is such that many sales transactions do not have a simple structure and may consist of various performance obligations that are satisfied at different times. Contracts entered into in the Diagnostics Division typically include performance obligations for instruments (including those provided under leasing arrangements), reagents and other consumables, and services. Instruments may be sold in cash sales transactions at discounted prices. Where instruments are provided under operating lease arrangements, some or the entire lease revenue may be variable and subject to subsequent reagents sales. Sales, net of discounts, are based on estimates regarding the related obligations, including their stand-alone selling prices or fair values. It requires judgement to determine when different obligations are satisfied, including whether enforceable purchase commitments for further obligations exist and when they arise. Out-licensing agreements may be entered into with no further obligation or may include commitments to conduct research, late-stage development, regulatory approval, co-marketing or manufacturing. These may be settled by a combination of upfront payments, milestone payments, other licensing fees, and reimbursements for services provided. Whether to consider these commitments as a single performance obligation or separate ones, or even being in scope of IFRS 15 'Revenues from Contracts with Customers', is not straightforward and requires some judgement. Depending on the conclusion, this may result in all revenue being calculated at inception and either being recognised at once or spread over the term of a longer performance obligation.

Sales are recorded net of allowances for estimated rebates, chargebacks, cash discounts and estimates of product returns, all of which are established at the time of sale. All product sales allowances are based on estimates of the amounts earned or to be claimed on the related sales. At 31 December 2018 the Group had CHF 3,785 million in provisions and accruals for expected sales returns, chargebacks and other rebates, including Medicaid in the US and similar rebates in other countries. The provisions and accruals relating to the US Pharmaceuticals business amounted to CHF 1,896 million, of which CHF 455 million were associated with expected sales returns. These estimates take into consideration historical experience, current contractual and statutory requirements, specific known market events and trends such as competitive pricing and new product introductions, estimated inventory levels, and the shelf life of products. If actual future results vary, these estimates need to be adjusted, with an effect on sales and earnings in the period of the adjustment.

Business combinations. The Group initially recognises the fair value of identifiable assets acquired, the liabilities assumed, any non-controlling interest and the consideration transferred in a business combination. Management judgement is particularly involved in the assessment of whether or not the net assets acquired constitute a business and in the recognition and fair value measurement of

intellectual property, inventories, contingent liabilities and contingent consideration. In making this assessment, management considers the underlying economic substance of the items concerned in addition to the contractual terms. Management also applies as it considers appropriate the optional 'concentration test' as set out in the amendments to IFRS 3 'Business Combinations' published in October 2018 to aid the assessment of whether a transaction represents a business combination or is simply in substance the purchase of a single asset or group of similar assets.

Impairment of property, plant and equipment, goodwill and intangible assets. At 31 December 2018 the Group had CHF 21,818 million in property, plant and equipment (see Note 8), CHF 8,948 million in goodwill (see Note 9) and CHF 9,346 million in intangible assets (see Note 10). Goodwill and intangible assets not yet available for use are reviewed annually for impairment. Property, plant and equipment and intangible assets in use are assessed for impairment when there is a triggering event that provides evidence that an asset may be impaired. To assess whether any impairment exists, estimates of expected future cash flows are used. Actual outcomes could vary significantly from such estimates. Factors such as changes in discount rates, the planned use of buildings, machinery or equipment or closure of facilities, the presence of competition, technical obsolescence and lower-than-anticipated product sales could lead to shorter useful lives or impairment.

Impairment of financial assets. At 31 December 2018 the Group had CHF 540 million in allowance for doubtful accounts for trade and lease receivables (see Note 12). The allowance for doubtful accounts is based on assumptions about risk of default and expected loss rates. The Group uses judgement in making these assumptions and selecting the inputs to the calculation of the allowance for doubtful accounts, based on the company's past experience, existing market conditions as well as forward-looking estimates at the end of each reporting period.

Pensions and other post-employment benefits. The Group operates a number of defined benefit plans and the fair values of the recognised plan assets and liabilities are based upon statistical and actuarial calculations. The measurement of the net defined benefit obligation is particularly sensitive to changes in the discount rate, inflation rate, expected mortality and medical cost trend rate assumptions. At 31 December 2018 the present value of the Group's defined benefit obligation is CHF 21,520 million (see Note 26). The actuarial assumptions used may differ materially from actual results due to changes in market and economic conditions, longer or shorter lifespans of participants, and other changes in the factors being assessed. These differences could impact the defined benefit plan assets and liabilities recognised in the balance sheet in future periods.

Legal provisions. The Group provides for anticipated legal settlement costs when there is a probable outflow of resources that can be reliably estimated. Where no reliable estimate can be made, no provision is recorded and contingent liabilities are disclosed where material. At 31 December 2018 the Group had CHF 578 million in legal provisions. The status of significant legal cases is disclosed in Note 20. These estimates consider the specific circumstances of each legal case, relevant legal advice and are inherently judgemental due to the highly complex nature of legal cases. The estimates could change substantially over time as new facts emerge and each legal case progresses.

Environmental provisions. The Group provides for anticipated environmental remediation costs when there is a probable outflow of resources that can be reasonably estimated. At 31 December 2018 the Group had CHF 491 million in environmental provisions (see Note 20). Environmental provisions consist primarily of costs to fully clean and refurbish contaminated sites, including landfills, and to treat and contain contamination at certain other sites. These estimates are inherently judgemental due to uncertainties related to the detection of previously unknown contamination, the method and extent of remediation, the percentage of the problematic materials attributable to the Group at the remediation sites, and the financial capabilities of other potentially responsible parties. The estimates could change substantially over time as new facts emerge and each environmental remediation progresses.

Contingent consideration provisions. The Group makes provision for the estimated fair value of contingent consideration arrangements arising from business combinations. At 31 December 2018 the Group had CHF 511 million in contingent consideration provisions (see Note 20) and the total potential payments under contingent consideration arrangements from business combinations could be up to CHF 1,009 million (see Note 30). The estimated amounts provided are the expected payments, determined by considering the possible scenarios of forecast sales and other performance criteria, the amount to be paid under each scenario, and the probability of each scenario, which is then discounted to a net present value. The estimates could change substantially over time as new facts emerge and each scenario develops.

Income taxes. At 31 December 2018 the Group had a current income tax net liability of CHF 3,600 million and a deferred tax net asset of CHF 3,511 million (see Note 5). Significant estimates are required to determine the current and deferred tax assets and liabilities. Some of these estimates are based on interpretations of existing tax laws or regulations. Where tax positions are uncertain, accruals are recorded within income tax liabilities for management's best estimate of the ultimate liability that is expected to arise based on the specific circumstances and the Group's historical experience. Factors that may have an impact on current and deferred taxes include changes in tax laws, regulations or rates, changing interpretations of existing tax laws or regulations, future levels of research and development spending and changes in pre-tax earnings.

Leases. The treatment of leasing transactions is mainly determined by whether the lease is considered to be an operating or finance lease. In making this assessment, management looks at the substance of the lease, as well as the legal form, and makes a judgement about whether substantially all of the risks and rewards of ownership are transferred. Arrangements which do not take the legal form of a lease but that nevertheless convey the right to use an asset are also covered by such assessments.

Consolidation. The Group periodically undertakes transactions that may involve obtaining control or significant influence over other companies. These transactions include equity acquisitions, asset purchases and alliance agreements. In all such cases management makes an assessment as to whether the Group has control or significant influence over the other company, and whether it should be consolidated as a subsidiary or accounted for as an associated company. In making this assessment, management considers the underlying economic substance of the transaction in addition to the contractual terms.

2. Operating segment information

The Group has two divisions, Pharmaceuticals and Diagnostics. Revenues are primarily generated from the sale of prescription pharmaceutical products and diagnostic instruments, reagents and consumables, respectively. Both divisions also derive revenues from the sale or licensing of products or technology to third parties. Residual operating activities from divested businesses and certain global activities are reported as 'Corporate'. These include the Corporate Executive Committee and global group functions for communications, human resources, finance (including treasury and taxes), legal, safety and environmental services. Subdivisional information is also presented for the Roche Pharmaceuticals and Chugai operating segments within the Pharmaceuticals Division.

Divisional information in millions of CHF

	Pharmaceuticals		Diagnostics		Corporate		Group	
	2018	2017	2018	2017	2018	2017	2018	2017
Revenues from external customers								
Sales	43,967	41,220	12,879	12,079	–	–	56,846	53,299
Royalties and other operating income	2,553	2,284	98	163	–	–	2,651	2,447
Total	**46,520**	**43,504**	**12,977**	**12,242**	**–**	**–**	**59,497**	**55,746**
Revenues from other operating segments								
Sales	–	–	12	14	–	–	12	14
Royalties and other operating income	–	–	–	–	–	–	–	–
Elimination of interdivisional revenue							(12)	(14)
Total	**–**	**–**	**12**	**14**	**–**	**–**	**–**	**–**
Segment results								
Operating profit	14,788	13,242	617	304	(636)	(543)	14,769	13,003
Capital expenditure								
Business combinations	1,826	–	–	193	–	–	1,826	193
Asset acquisitions	1,725	–	–	–	–	–	1,725	–
Additions to property, plant and equipment	2,340	2,030	1,376	1,443	80	4	3,796	3,477
Additions to intangible assets	802	736	18	33	–	–	820	769
Total	**6,693**	**2,766**	**1,394**	**1,669**	**80**	**4**	**8,167**	**4,439**
Research and development								
Research and development costs	10,299	9,704	1,793	1,588	–	–	12,092	11,292
Other segment information								
Depreciation of property, plant and equipment	1,129	1,165	1,097	1,024	66	7	2,292	2,196
Amortisation of intangible assets	1,131	1,359	163	332	–	–	1,294	1,691
Impairment of property, plant and equipment	137	184	1	37	3	12	141	233
Impairment of goodwill	2,147	384	107	674	–	–	2,254	1,058
Impairment of intangible assets	233	2,188	849	272	–	–	1,082	2,460
Equity compensation plan expenses	392	388	78	73	38	34	508	495

Pharmaceuticals subdivisional information in millions of CHF

	Roche Pharmaceuticals		Chugai		Pharmaceuticals Division	
	2018	2017	2018	2017	2018	2017
Revenues from external customers						
Sales	40,266	37,507	3,701	3,713	43,967	41,220
Royalties and other operating income	2,239	2,231	314	53	2,553	2,284
Total	**42,505**	**39,738**	**4,015**	**3,766**	**46,520**	**43,504**
Revenues from other operating segments						
Sales	1,340	1,222	974	670	2,314	1,892
Royalties and other operating income	104	82	215	257	319	339
Elimination of income within division					(2,633)	(2,231)
Total	**1,444**	**1,304**	**1,189**	**927**	**–**	**–**
Segment results						
Operating profit	13,702	12,395	1,136	856	14,838	13,251
Elimination of results within division					(50)	(9)
Operating profit	**13,702**	**12,395**	**1,136**	**856**	**14,788**	**13,242**
Capital expenditure						
Business combinations	1,826	–	–	–	1,826	–
Asset acquisitions	1,725	–	–	–	1,725	–
Additions to property, plant and equipment	1,704	1,732	636	298	2,340	2,030
Additions to intangible assets	777	700	25	36	802	736
Total	**6,032**	**2,432**	**661**	**334**	**6,693**	**2,766**
Research and development						
Research and development costs	9,434	9,012	919	834	10,353	9,846
Elimination of costs within division					(54)	(142)
Total	**9,434**	**9,012**	**919**	**834**	**10,299**	**9,704**
Other segment information						
Depreciation of property, plant and equipment	1,001	1,039	128	126	1,129	1,165
Amortisation of intangible assets	1,118	1,344	13	15	1,131	1,359
Impairment of property, plant and equipment	136	184	1	0	137	184
Impairment of goodwill	2,147	384	0	0	2,147	384
Impairment of intangible assets	196	2,168	37	20	233	2,188
Equity compensation plan expenses	389	384	3	4	392	388

Net operating assets in millions of CHF

	Assets			Liabilities			Net assets		
At 31 December	2018	2017	2016	2018	2017	2016	2018	2017	2016
Pharmaceuticals	40,246	39,174	42,212	(12,559)	(12,215)	(11,456)	27,687	26,959	30,756
Diagnostics	18,898	19,833	20,329	(4,576)	(4,390)	(4,141)	14,322	15,443	16,188
Corporate	322	133	146	(580)	(430)	(463)	(258)	(297)	(317)
Total operating	**59,466**	**59,140**	**62,687**	**(17,715)**	**(17,035)**	**(16,060)**	**41,751**	**42,105**	**46,627**
Non-operating	19,051	17,536	14,132	(30,436)	(30,634)	(34,357)	(11,385)	(13,098)	(20,225)
Group	**78,517**	**76,676**	**76,819**	**(48,151)**	**(47,669)**	**(50,417)**	**30,366**	**29,007**	**26,402**

Net operating assets – Pharmaceuticals subdivisional information in millions of CHF

	Assets			Liabilities			Net assets		
At 31 December	2018	2017	2016	2018	2017	2016	2018	2017	2016
Roche Pharmaceuticals	36,421	35,690	38,783	(12,524)	(11,930)	(11,175)	23,897	23,760	27,608
Chugai	5,627	4,900	4,897	(1,042)	(974)	(1,025)	4,585	3,926	3,872
Elimination within division	(1,802)	(1,416)	(1,468)	1,007	689	744	(795)	(727)	(724)
Pharmaceuticals Division	**40,246**	**39,174**	**42,212**	**(12,559)**	**(12,215)**	**(11,456)**	**27,687**	**26,959**	**30,756**

Information by geographical area in millions of CHF

	Revenues from external customers		Non-current assets	
	Sales	Royalties and other operating income	Property, plant and equipment	Goodwill and intangible assets
2018				
Switzerland	627	297	5,658	2,485
Germany	3,147	32	4,030	995
Rest of Europe	9,828	14	962	434
Europe	**13,602**	**343**	**10,650**	**3,914**
United States	26,105	1,976	6,953	13,808
Rest of North America	931	1	68	373
North America	**27,036**	**1,977**	**7,021**	**14,181**
Latin America	2,870	0	308	8
Japan	4,175	315	2,114	189
Rest of Asia	7,689	16	1,628	1
Asia	**11,864**	**331**	**3,742**	**190**
Africa, Australia and Oceania	1,474	0	97	1
Total	**56,846**	**2,651**	**21,818**	**18,294**
2017				
Switzerland	574	480	5,411	2,723
Germany	3,041	29	4,038	1,042
Rest of Europe	10,135	17	982	482
Europe	**13,750**	**526**	**10,431**	**4,247**
United States	23,122	1,853	6,685	13,956
Rest of North America	897	1	74	21
North America	**24,019**	**1,854**	**6,759**	**13,977**
Latin America	3,024	0	328	9
Japan	4,214	53	1,611	208
Rest of Asia	6,824	14	1,671	2
Asia	**11,038**	**67**	**3,282**	**210**
Africa, Australia and Oceania	1,468	0	112	2
Total	**53,299**	**2,447**	**20,912**	**18,445**

Sales are allocated to geographical areas by destination according to the location of the customer. Royalties and other operating income are allocated according to the location of the Group company that receives the revenue.

Major customers

In total three US national wholesale distributors represent approximately a third of the Group's revenues in 2018. The three US national wholesale distributors are McKesson Corp. with CHF 9 billion (2017: CHF 7 billion), AmerisourceBergen Corp. with CHF 7 billion (2017: CHF 6 billion) and Cardinal Health, Inc. with CHF 5 billion (2017: CHF 5 billion). Approximately 95% of these revenues were in the Pharmaceuticals operating segment, with the residual in the Diagnostics segment.

3. Revenue

Disaggregated revenue information

Disaggregation of revenue in millions of CHF

	2018			2017		
	Revenue from contracts with customers	Revenue from other sources	Total	Revenue from contracts with customers	Revenue from other sources	Total
Pharmaceuticals Division						
Sales by therapeutic area						
Oncology	26,183	–	26,183	25,743	–	25,743
Immunology	8,160	–	8,160	7,611	–	7,611
Neuroscience	3,005	–	3,005	1,542	–	1,542
Ophthalmology	1,659	–	1,659	1,414	–	1,414
Infectious diseases	1,084	–	1,084	1,357	–	1,357
Other therapeutic areas	3,876	–	3,876	3,553	–	3,553
Sales	**43,967**	**–**	**43,967**	**41,220**	**–**	**41,220**
Royalty income	1,670	–	1,670	1,551	–	1,551
Income from out-licensing agreements	267	–	267	122	–	122
Income from disposal of products and other	333	283	616	417	194	611
Royalties and other operating income	**2,270**	**283**	**2,553**	**2,090**	**194**	**2,284**
Diagnostics Division						
Sales by business area						
Centralised and Point of Care Solutions	7,099	669	7,768	6,542	637	7,179
Diabetes Care	1,977	3	1,980	1,960	5	1,965
Molecular Diagnostics	1,912	107	2,019	1,831	89	1,920
Tissue Diagnostics	1,047	65	1,112	946	69	1,015
Sales	**12,035**	**844**	**12,879**	**11,279**	**800**	**12,079**
Royalty income	58	–	58	111	–	111
Income from out-licensing agreements	2	–	2	27	–	27
Income from disposal of products and other	15	23	38	4	21	25
Royalties and other operating income	**75**	**23**	**98**	**142**	**21**	**163**
Total	**58,347**	**1,150**	**59,497**	**54,731**	**1,015**	**55,746**

Revenue from other sources primarily relates to lease revenue and collaboration income for which the counterparty is not considered a customer, such as income from profit-sharing arrangements.

Gross-to-net sales reconciliation for the Pharmaceuticals Division

The gross-to-net sales reconciliation for the Pharmaceuticals Division is shown in the table below. The companies in the Diagnostics Division have similar reconciling items, but at much lower amounts.

Pharmaceuticals Division sales gross-to-net reconciliation in millions of CHF

	2018	2017
Gross sales	53,334	49,502
Government and regulatory mandatory price reductions	(6,064)	(5,490)
Contractual price reductions	(2,423)	(2,078)
Cash discounts	(476)	(432)
Customer returns reserves	(326)	(133)
Others	(78)	(149)
Net sales	**43,967**	**41,220**

Government and regulatory mandatory price reductions. These consist of mandatory price reductions. The major elements are 340B Drug Discount Program, Medicaid, and other plans in the US, which totalled USD 5.5 billion, equivalent to CHF 5.4 billion (2017: USD 4.7 billion, equivalent to CHF 4.7 billion).

Contractual price reductions. These include rebates and chargebacks that are the result of contractual agreements that are primarily volume-based and performance-based.

Cash discounts. These include credits offered to wholesalers for remitting payment on their purchases within contractually defined incentive periods.

Customer returns reserves. These are allowances established for expected product returns.

Sales reductions that are expected to be withheld by the customer upon settlement, such as contractual price reductions and cash discounts, are recorded in the balance sheet as a deduction from trade receivables (see Note 12). Sales reductions that are separately payable to customers, governmental health authorities or healthcare regulatory authorities are recorded in the balance sheet as accrued liabilities (see Note 19). Provisions for sales returns are recorded in the balance sheet as other provisions (see Note 20).

Contract balances

Receivables in millions of CHF

	2018	2017	2016
Accounts receivable [12]	9,776	9,577	8,760
Other current receivables – contracts from customers [16]	604	628	749
Other non-current receivables – contracts from customers [15]	25	38	27
Total receivables	**10,405**	**10,243**	**9,536**

Other current receivables mainly include royalty and licensing receivables. At 31 December 2018 total receivables include lease receivables of 2% which are not considered receivables from contracts with customers.

Contract assets in millions of CHF

	2018	2017	2016
Accrued income	73	25	0
Total contract assets	**73**	**25**	**0**

Contract liabilities in millions of CHF

	2018	2017	2016
Deferred income – non-current	21	77	82
Deferred income – current	290	372	184
Total contract liabilities	**311**	**449**	**266**

Movement in contract liabilities in millions of CHF

	2018	2017
At 1 January	449	266
Business combinations	22	3
Revenue recognised that was included in the contract liability balance at the beginning of the year	(314)	(145)
Increases due to cash received or receivable, excluding amounts recognised as revenue during the year	162	319
Divestment of subsidiaries	(1)	0
Currency translation effects	(7)	6
At 31 December	**311**	**449**

Revenue recognised in relation to performance obligations satisfied in previous years

In 2018 there was an increase in revenue recognised of CHF 30 million (2017: increase of CHF 123 million) relating to performance obligations that were satisfied in previous periods, mainly due to adjustments of sales deduction provisions and accruals for expected sales returns, chargebacks and other allowances in respect of previous years.

Remaining performance obligations in (partially) unsatisfied long-term contracts

Remaining performance obligations in (partially) unsatisfied long-term contracts are either included in deferred income or are related to amounts the Group expects to receive for goods and services that have not yet been transferred to customers under existing, non-cancellable or otherwise enforceable contracts. These are mainly associated with contracts in the Diagnostics Division that have minimum purchase commitments related to reagents and consumables for previously sold instruments as well as monitoring and maintenance services. For contracts that have an original duration of one year or less, the Group has elected the practical expedient to not disclose the transaction price for remaining performance obligations at the end of each reporting period and at which point in time the Group expects to recognise these sales.

Transaction price allocated to contracts with (partially) unsatisfied performance obligations in millions of CHF

	2018
No contract liability held	2,730
Contract liability held	311
Total	**3,041**
Thereof expected to be recognised as revenue	
– Within one year	1,130
– Between one and five years	1,804
– More than five years	107
Total	**3,041**

4. Net financial expense

Upon transition to IFRS 9 (see Note 33) the Group elected not to restate comparative information. As a result the information provided below for the current period is on the IFRS 9 basis and the comparative information is on the IAS 39 basis.

Financing costs in millions of CHF

	2018	2017
Interest expense	(594)	(585)
Amortisation of debt discount [21]	(11)	(13)
Net gains (losses) on redemption and repurchase of bonds and notes	0	(74)
Discount unwind [20]	(26)	(20)
Net interest cost of defined benefit plans [26]	(139)	(147)
Total financing costs	**(770)**	**(839)**

Other financial income (expense) in millions of CHF

	2018	2017
Net gains (losses) on sale of equity securities (IAS 39)	n/a	186
Dividend income (available-for-sale equity securities – IAS 39)	n/a	2
Write-downs and impairments of equity securities (IAS 39)	n/a	(17)
Net gains (losses) on equity investments / securities at fair value through profit or loss (IFRS 9)	310	n/a
Dividend income from equity investments / securities at fair value through profit or loss (IFRS 9)	0	n/a
Dividend income from equity investments / securities at fair value through OCI (IFRS 9)	1	n/a
Net income from equity securities	**311**	**171**
Interest income (available-for-sale debt securities and amortised cost – IAS 39)	n/a	30
Net gains (losses) on sale of debt securities (available-for-sale securities and amortised costs – IAS 39)	n/a	3
Interest income (fair value through OCI debt securities and amortised cost – IFRS 9)	30	n/a
Net gains (losses) on sale of debt securities (fair value through OCI – IFRS 9)	6	n/a
Net interest income and income from debt securities	**36**	**33**
Net foreign exchange gains (losses)	(208)	(238)
Net gains (losses) on foreign currency derivatives	48	123
Foreign exchange gains (losses)	**(160)**	**(115)**
Gains (losses) on net monetary position in hyperinflationary economies	(18)	0
Net other financial income (expense)	(26)	(3)
Associates [23]	6	(2)
Total other financial income (expense)	**149**	**84**

Other financial income (expense) has been adjusted to reflect the presentational changes required as a result from implementing IFRS 9 'Financial Instruments' as described in Note 33.

Net financial expense in millions of CHF

	2018	2017
Financing costs	(770)	(839)
Other financial income (expense)	149	84
Net financial expense	**(621)**	**(755)**
Financial result from Treasury management	(488)	(606)
Financial result from Pension management	(139)	(147)
Associates [23]	6	(2)
Net financial expense	**(621)**	**(755)**

Hyperinflationary economies

Since 1 July 2018 the Group has considered Argentina to be a hyperinflationary economy, in the context of IAS 29 'Financial Reporting in Hyperinflationary Economies'. The cumulative inflation index over the last three years exceeds 100%, as measured by the National Wholesaler Price Index (Sistema de Índices de Precios Mayoristas).

Accordingly the Group has reviewed the reporting from its affiliates in Argentina, and where necessary restated them in line with IAS 29. The potential adjustments resulting from the application of IAS 29 do not have a significant impact on the Group's operating results and balance sheet. An adjustment is recorded for the gains (losses) on the net monetary position, which is a loss of CHF 18 million resulting from the loss in purchasing power of the positive net monetary position during 2018 of the Group's Argentinian affiliates.

5. Income taxes

Income tax expenses in millions of CHF

	2018	2017
Current income taxes	(3,881)	(4,846)
Deferred taxes	598	1,423
Total income tax (expense)	**(3,283)**	**(3,423)**

Since the Group operates internationally, it is subject to income taxes in many different tax jurisdictions. The Group calculates its average expected tax rate as a weighted average of the tax rates in the tax jurisdictions in which the Group operates. This rate changes from year to year due to changes in the mix of the Group's taxable income and changes in local tax rates.

The Group's average expected tax rate decreased to 17.8% in 2018 (2017: 21.5%). This was largely due to a decrease in the US Federal tax rate from 35% to 21% which was enacted in December 2017 and effective from 1 January 2018.

The Group's effective tax rate decreased to 23.2% in 2018 (2017: 27.9%). The main driver for the decrease was the impact from the US tax reform which lowered the average expected tax rate mentioned above. In addition the US tax reform had a transitional impact on the 2017 results from the initial estimate of the effect on deferred tax balances of the tax rate changes which resulted in an expense of CHF 116 million increasing the 2017 Group effective tax rate. A true-up adjustment of this transitional effect was included in 2018 and resulted in an income of CHF 35 million.

The Group's effective tax rate can be reconciled to the Group's average expected tax rate as follows:

Reconciliation of the Group's effective tax rate

	2018	2017
Average expected tax rate	17.8%	21.5%
Tax effect of		
– Non-taxable income/non-deductible expenses	+4.5%	+4.8%
– Equity compensation plans	+0.1%	+0.2%
– Research and development tax credits and other deductions	–2.0%	–2.9%
– US state tax impacts	+0.4%	+0.5%
– Tax on unremitted earnings	+1.2%	+1.7%
– Transitional effect of changes in US tax rates	–0.2%	+0.9%
– Prior year and other differences	+1.4%	+1.2%
Group's effective tax rate	**23.2%**	**27.9%**

The income tax benefit recorded in respect of equity compensation plans, which varies according to the price of the underlying equity, was CHF 59 million (2017: CHF 87 million). Had the income tax benefits been recorded solely on the basis of the IFRS 2 expense multiplied by the applicable tax rate, then a benefit of approximately CHF 78 million (2017: CHF 118 million) would have been recorded.

Tax effects of other comprehensive income in millions of CHF

	2018			2017		
	Pre-tax amount	Tax	After-tax amount	Pre-tax amount	Tax	After-tax amount
Remeasurements of defined benefit plans	197	(63)	134	732	(328)	404
Available-for-sale investments (IAS 39)	n/a	n/a	n/a	(37)	15	(22)
Equity investments at fair value through OCI (IFRS 9)	89	(2)	87	n/a	n/a	n/a
Debt securities at fair value through OCI (IFRS 9)	(8)	1	(7)	n/a	n/a	n/a
Cash flow hedges	(19)	4	(15)	(31)	20	(11)
Currency translation of foreign operations	(290)	–	(290)	362	–	362
Other comprehensive income	**(31)**	**(60)**	**(91)**	**1,026**	**(293)**	**733**

Income tax assets (liabilities) in millions of CHF

	2018	2017	2016
Current income taxes			
– Assets	208	348	335
– Liabilities	(3,808)	(3,408)	(2,713)
Net current income tax assets (liabilities)	**(3,600)**	**(3,060)**	**(2,378)**
Deferred taxes			
– Assets	3,895	3,576	2,826
– Liabilities	(384)	(495)	(838)
Net deferred tax assets (liabilities)	**3,511**	**3,081**	**1,988**

Current income tax liabilities include accruals for uncertain tax positions.

Current income taxes: movements in recognised net assets (liabilities) in millions of CHF

	2018	2017
Net current income tax asset (liability) at 1 January	(3,060)	(2,378)
Income taxes paid	3,288	3,909
Business combinations	6	0
(Charged) credited to the income statement	(3,881)	(4,846)
(Charged) credited to equity from equity compensation plans and other transactions with shareholders	53	152
Currency translation effects and other movements	(6)	103
Net current income tax asset (liability) at 31 December	**(3,600)**	**(3,060)**

Deferred taxes: movements in recognised net assets (liabilities) in millions of CHF

	Property, plant and equipment	Intangible assets	Defined benefit plans	Other temporary differences	Total
Year ended 31 December 2017					
At 1 January 2017	(862)	(2,648)	1,570	3,928	1,988
Business combinations [6]	0	(28)	0	0	(28)
(Charged) credited to the income statement	198	1,812	(98)	(489)	1,423
(Charged) credited to other comprehensive income [22]	–	–	(328)	35	(293)
(Charged) credited to equity from equity compensation plans and other transactions with shareholders	–	–	–	(128)	(128)
Currency translation effects and other movements	6	119	37	(43)	119
At 31 December 2017	**(658)**	**(745)**	**1,181**	**3,303**	**3,081**
Year ended 31 December 2018					
At 1 January 2018	(658)	(745)	1,181	3,303	3,081
Implementation of IFRS 9 'Financial Instruments' [33]	–	–	–	1	1
At 1 January 2018 (revised)	(658)	(745)	1,181	3,304	3,082
Business combinations [6]	0	(160)	0	33	(127)
Asset acquisitions [6]	0	0	0	112	112
(Charged) credited to the income statement	(38)	332	9	295	598
(Charged) credited to other comprehensive income [22]	–	–	(63)	3	(60)
(Charged) credited to equity from equity compensation plans and other transactions with shareholders	–	21	–	(28)	(7)
Currency translation effects and other movements	(1)	(38)	(26)	(22)	(87)
At 31 December 2018	**(697)**	**(590)**	**1,101**	**3,697**	**3,511**

The deferred tax net assets for other temporary differences mainly relate to accrued and other liabilities, provisions and unrealised profit in inventory.

Deferred tax assets are recognised for tax losses carried forward only to the extent that realisation of the related tax benefit is probable. The Group has unrecognised tax losses, including valuation allowances, as follows:

Unrecognised tax losses: expiry

	2018		2017	
	Amount (CHF m)	Applicable tax rate	Amount (CHF m)	Applicable tax rate
Within one year	183	12%	0	–
Between one and five years	2,150	12%	2,358	12%
More than five years	10,893	5%	9,103	5%
Total unrecognised tax losses	**13,226**	**6%**	**11,461**	**6%**

The 'More than five years' category includes losses that cannot be used for US state income tax purposes in those states which only permit tax reporting on a separate entity basis.

Deferred tax liabilities have not been established for the withholding tax and other taxes that would be payable on the remittance of earnings of foreign subsidiaries, where such amounts are currently regarded as permanently reinvested for the purpose of these financial statements. The total unremitted earnings of the Group, regarded as permanently reinvested for the purpose of these financial statements, were CHF 33.9 billion at 31 December 2018 (2017: CHF 29.1 billion).

6. Mergers and acquisitions

The Group has implemented the amendments to IFRS 3 'Business Combinations' issued in October 2018. The amendments further clarify the definition of a business. The effect of the amendments is particularly applicable for many of the acquisitions carried out by the Group, since the value in the acquired companies often largely consists of the rights to a single product or technology. From 2018 such transactions will be accounted for as asset acquisitions rather than business combinations.

This note has been expanded and renamed as 'Mergers and acquisitions' to include both transactions accounted for as business combinations and asset acquisitions. Asset acquisitions are acquisitions of legal entities that do not qualify as business combinations under IFRS 3. Cash consideration paid for asset acquisitions at the transaction date and subsequent additional contingent payments made upon the achievement of performance-related development milestones are now presented in the line 'Asset acquisitions' as disclosed separately below. Subsequent consideration for performance-related development milestones for transactions treated as asset acquisitions is recognised as intangible assets when the specific milestones have been achieved. Previously intangible assets acquired in asset acquisitions were included in the line items 'Purchase of intangible assets' in the statement of cash flows and 'Additions' in Note 10 'Intangible assets'.

As a result of the amendments to IFRS 3 (see Note 33) the acquisition of Ignyta, Inc. has been reassessed and accounted for as an asset acquisition in these Annual Financial Statements rather than as a business combination as disclosed in the 2018 Interim Financial Statements. This led to a decrease in goodwill of CHF 267 million, a decrease in intangible assets of CHF 103 million and a decrease in deferred tax liabilities of CHF 370 million.

Business combinations – 2018

Flatiron Health, Inc. On 5 April 2018 the Group acquired a 100% controlling interest in Flatiron Health, Inc. ('Flatiron Health'), a privately owned US company based in New York City. Flatiron Health is a market leader in the curation and development of real-world evidence for cancer research as well as in oncology-specific electronic health record software. Flatiron Health is reported in the Pharmaceuticals Division. The total consideration was USD 1,616 million, which was paid in cash.

The identifiable assets acquired and liabilities assumed are set out in the table below.

Business combinations – 2018: net assets acquired in millions of CHF

	Flatiron Health
Intangible assets	
– Product intangibles: in use [10]	608
– Marketing intangibles: in use [10]	87
Deferred tax assets [5]	33
Cash and cash equivalents	21
Deferred tax liabilities [5]	(160)
Other net assets (liabilities)	76
Net identifiable assets	**665**
Fair value of previously held interest	(240)
Goodwill [9]	1,128
Total consideration	**1,553**
Cash	1,553
Total consideration	**1,553**

The fair value of Flatiron Health's technology platform was determined using an excess earning method that is based on management forecasts and observable market data for discount rates, tax rates and foreign exchange rates. The present value was calculated using a risk-adjusted discount rate of 10.4% for Flatiron Health. The valuation was performed by an independent valuer.

The Flatiron Health accounts receivable is comprised of gross contractual amounts due of CHF 30 million which were all expected to be collectable at the date of the acquisition.

Goodwill represents the value of accelerating progress towards data-driven personalised healthcare in cancer and to advance the use of real-world evidence to set new industry standards for oncology research and development. It also represents a control premium, the acquired work force and expected synergies. None of the goodwill is expected to be deductible for income tax purposes.

The Group recognised a financial gain of CHF 78 million for fair valuing the 12% interest in Flatiron Health held by the Group prior to the transaction. This gain is included in the statement of changes in equity within the line item 'Net change in fair value – financial assets at fair value through OCI' in 2018 and has been transferred to 'Retained earnings' upon obtaining control.

Directly attributable transaction costs of CHF 3 million were reported in the Pharmaceuticals operating segment within general and administration expenses.

In the nine months to 31 December 2018 Flatiron Health contributed revenue of CHF 56 million and a net loss (after tax) of CHF 175 million to the results reported for the Pharmaceuticals Division and the Group. If the acquisition had occurred on 1 January 2018 management estimates that Flatiron Health would have contributed revenue of CHF 78 million and a net loss (after tax) of CHF 187 million in 2018. This information is provided for illustrative purposes only and is not necessarily indicative of the results of the combined Group that would have occurred had Flatiron Health actually been acquired at the beginning of the year, or indicative of the future results of the combined Group.

Business combinations – 2017

mySugr GmbH. On 29 June 2017 the Group acquired a 100% controlling interest in mySugr GmbH ('mySugr'), a private company based in Vienna, Austria. mySugr is reported in the Diagnostics operating segment as part of the Diabetes Care business. The total cash consideration was EUR 64 million.

Viewics, Inc. On 27 November 2017 the Group acquired a 100% controlling interest in Viewics, Inc. ('Viewics'), a privately owned US company based in San Jose, California. Viewics is reported in the Diagnostics operating segment. The total consideration was USD 81 million, of which USD 62 million was paid in cash, USD 9 million was deferred consideration which is being paid over the period from the date of control to 2021 and USD 10 million arose from a contingent consideration arrangement. The contingent payments are based on the achievement of performance-related milestones and the range of undiscounted outcomes is between zero and USD 10 million.

The identifiable assets acquired and liabilities assumed are set out in the table below.

Business combinations – 2017: net assets acquired in millions of CHF

	mySugr	Viewics	Total
Intangible assets			
– Product intangibles: in use [10]	20	40	60
– Marketing intangibles: in use [10]	29	0	29
Cash and cash equivalents	1	4	5
Deferred tax liabilities [5]	(12)	(16)	(28)
Other net assets (liabilities)	(2)	1	(1)
Net identifiable assets	**36**	**29**	**65**
Fair value of previously held interest	(11)	(8)	(19)
Goodwill [9]	45	59	104
Total consideration	**70**	**80**	**150**
Cash	70	62	132
Deferred consideration [20]	0	8	8
Contingent consideration [20]	0	10	10
Total consideration	**70**	**80**	**150**

The fair value of the product intangible asset for mySugr is determined using a replacement cost method. The fair value of the other intangible assets is determined using an excess earning method that is based on management forecasts and observable market data for discount rates, tax rates and foreign exchange rates. The present value is calculated using a risk-adjusted discount rate of 13.0% for mySugr and 9.5% for Viewics. The valuations were performed by independent valuers.

Goodwill represents a control premium, the acquired work force and the synergies that can be expected from integrating the acquired companies into the Group's existing business. None of the goodwill is expected to be deductible for income tax purposes.

The Group recognised a financial gain of CHF 7 million and CHF 2 million respectively for fair valuing the 12% interest in mySugr and the 10% interest in Viewics held by the Group prior to the transaction. This gain is included in other financial income (expense) for 2017.

Directly attributable transaction costs of CHF 2 million were reported in the Diagnostics operating segment within general and administration expenses.

The impact of the mySugr and Viewics acquisitions on the 2017 results for the Diagnostics Division and the Group were not material.

Cash flows from business combinations

Business combinations: net cash outflow in millions of CHF

	Pharmaceuticals	Diagnostics	2018 Total	Pharmaceuticals	Diagnostics	2017 Total
Cash consideration paid	(1,553)	0	(1,553)	0	(132)	(132)
Deferred consideration paid	0	(4)	(4)	0	(5)	(5)
Contingent consideration paid [20]	(9)	(5)	(14)	(5)	(141)	(146)
Cash in acquired company	21	0	21	0	5	5
Transaction costs [1)]	n/a	n/a	n/a	0	(2)	(2)
Total net cash outflow	**(1,541)**	**(9)**	**(1,550)**	**(5)**	**(275)**	**(280)**

1) In 2018 directly attributable transaction costs for business combinations amounted to CHF 3 million and are included in the cash flow from operating activities.

Asset acquisitions – 2018

Ignyta, Inc. On 8 February 2018 the Group acquired a 100% controlling interest in Ignyta, Inc. ('Ignyta'), a publicly owned US company based in San Diego, California, that had been listed on Nasdaq. With the acquisition, the Group obtained rights to Ignyta's lead product candidate, entrectinib, an orally bioavailable, CNS-active tyrosine kinase inhibitor for patients who have tumours that harbour ROS1 or NTRK fusions. Ignyta is reported in the Pharmaceuticals Division. The total consideration was USD 1,949 million, which was paid in cash.

Other acquisitions. On 27 September 2018 the Group acquired a 100% controlling interest in Tusk Therapeutics Ltd ('Tusk'), a private company based in Stevenage, United Kingdom. Tusk has developed an antibody with a novel mode of action aimed at depleting regulatory T-cells which suppress immune responses, including those against cancer cells. Tusk is reported in the Pharmaceuticals Division.

On 20 November 2018 the Group acquired a 100% controlling interest in Jecure Therapeutics, Inc. ('Jecure'), a privately owned US company based in San Diego, California. With the acquisition, the Group obtained rights to Jecure's preclinical portfolio of NLRP3 inhibitors. Jecure is reported in the Pharmaceuticals Division.

The total cash consideration paid at the acquisition date for both acquisitions was CHF 150 million. Additional contingent payments may be made based upon the achievement of performance-related milestones.

Asset acquisitions – 2018: net assets acquired in millions of CHF

	Ignyta	Other acquisitions	Total
Intangible assets			
– Product intangibles: not available for use [10]	1,581	144	1,725
Deferred tax assets [5]	112	0	112
Cash and cash equivalents	164	1	165
Other net assets (liabilities)	(18)	5	(13)
Net identifiable assets	**1,839**	**150**	**1,989**
Cash	1,839	150	1,989
Total cash consideration	**1,839**	**150**	**1,989**

Cash flows from asset acquisitions

Asset acquisitions: net cash outflow in millions of CHF

	Pharmaceuticals	Diagnostics	2018 Total
Cash consideration paid	(1,989)	0	(1,989)
Cash in acquired company	165	0	165
Total net cash outflow	**(1,824)**	**0**	**(1,824)**

In 2018 directly attributable transaction costs for acquisitions other than business combinations amounted to CHF 9 million and are included in the cash flow from operating activities.

Foundation Medicine transaction

On 7 April 2015 the Group acquired a 61.3% controlling interest in Foundation Medicine, Inc. ('FMI'), which has been treated as a fully consolidated subsidiary of the Group since that date. The common stock of FMI was publicly traded and was listed on the Nasdaq under the stock code 'FMI'. At 31 December 2017 the Group's interest in FMI was 57.5%.

On 18 June 2018 the Group entered into a merger agreement with FMI to acquire the outstanding shares of FMI's common stock not already owned by the Group at a price of USD 137.00 per share in cash. The merger agreement was approved by the Board of Roche and a special committee of the independent directors of FMI and by its full board of directors. A tender offer was launched on 2 July 2018. On 31 July 2018 the transaction closed and FMI became a 100% owned subsidiary of the Group. It has been accounted for in full as an equity transaction. The cash consideration for the purchase of all public shares, including shares issuable on FMI's outstanding stock incentive plans and payment of related fees and expenses, amounted to USD 2.3 billion, as set out in the table below. These amounts have been recorded to equity as a change in ownership interest in subsidiaries.

Foundation Medicine transaction

	USD million	CHF million
Purchase of publicly held shares	2,222	2,196
Settlement of outstanding stock options and vested restricted stock awards	51	50
Directly attributable transaction costs	41	41
Total cash consideration	**2,314**	**2,287**
Income tax effects	(46)	(46)
Change in ownership interest in subsidiaries	**2,268**	**2,241**

7. Global restructuring plans

During 2018 the Group continued with the implementation of various resourcing flexibility plans initiated in 2017 in its Pharmaceuticals Division to address various future challenges including biosimilar competition. The focus areas of the plans include biologics manufacturing, commercial operations and product development/strategy. The Group also continued with the implementation of several major global restructuring plans initiated in prior years, notably the strategic realignment of the Pharmaceuticals Division's manufacturing network, and programmes to address long-term strategy in the Diagnostics Division.

Global restructuring plans: costs incurred in millions of CHF

	Diagnostics[1]	Site consolidation[2]	Other plans[3]	Total
Year ended 31 December 2018				
Global restructuring costs				
– Employee-related costs	105	153	202	460
– Site closure costs	49	173	5	227
– Divestment of products and businesses	8	0	0	8
– Other reorganisation expenses	73	1	138	212
Total global restructuring costs	**235**	**327**	**345**	**907**
Additional costs				
– Impairment of goodwill	0	0	0	0
– Impairment of intangible assets	0	0	0	0
– Legal and environmental cases	7	12	0	19
Total costs	**242**	**339**	**345**	**926**
Year ended 31 December 2017				
Global restructuring costs				
– Employee-related costs	152	13	258	423
– Site closure costs	48	245	2	295
– Divestment of products and businesses	0	166	0	166
– Other reorganisation expenses	92	160	72	324
Total global restructuring costs	**292**	**584**	**332**	**1,208**
Additional costs				
– Impairment of goodwill	0	0	0	0
– Impairment of intangible assets	0	0	0	0
– Legal and environmental cases	0	46	0	46
Total costs	**292**	**630**	**332**	**1,254**

1) Includes strategy plans in the Diagnostics Division.
2) Includes the Pharmaceuticals Division's strategic realignment of its manufacturing network and resourcing flexibility in biologics manufacturing network.
3) Includes plans for outsourcing of IT and other functions to shared service centres and external providers and for resourcing flexibility in the Pharmaceuticals Division's commercial operations and global product development/strategy organisations.

Diagnostics Division

In 2018 strategy plans in the Diagnostics Division incurred costs of CHF 87 million mainly for employee-related matters (2017: CHF 212 million). Costs of CHF 36 million are included for the divestment of a subsidiary in Germany and costs related to a reorganisation in the Molecular Diagnostics business were CHF 27 million. Spending on other smaller plans within the division was CHF 92 million (2017: CHF 80 million).

Site consolidation

In 2018 costs from the Pharmaceuticals Division's strategic realignment of its manufacturing network were CHF 117 million (2017: CHF 480 million) and mainly related to the exit from the manufacturing site at Clarecastle, Ireland. The resourcing flexibility in biologics manufacturing network incurred costs of CHF 215 million, mainly relating to asset impairment and severance costs (2017: CHF 74 million). Integration costs following the Ignyta acquisition were CHF 46 million.

Other global restructuring plans

In 2018 resourcing flexibility initiatives in the Pharmaceuticals Division incurred costs of CHF 146 million (2017: CHF 247 million), mainly employee-related. The other major item was CHF 111 million for plans for outsourcing to shared service centres and external providers (2017: CHF 51 million). Other plans include IT plans totalling CHF 88 million (2017: CHF 34 million).

Global restructuring plans: summary of costs incurred in millions of CHF

	2018	2017
Employee-related costs		
– Termination costs	401	378
– Defined benefit plans	(14)	(7)
– Other employee-related costs	73	52
Total employee-related costs	**460**	**423**
Site closure costs		
– Impairment of property, plant and equipment	74	192
– Accelerated depreciation of property, plant and equipment	39	48
– (Gains) losses on disposal of property, plant and equipment	(18)	0
– Other site closure costs	132	55
Total site closure costs	**227**	**295**
Divestment of products and businesses		
– (Gains) losses on divestment of subsidiaries [23]	24	126
– Other (gains) losses on divestment of products and businesses	(16)	40
Total costs on divestment of products and businesses	**8**	**166**
Other reorganisation expenses	212	324
Total global restructuring costs	**907**	**1,208**
Additional costs		
– Impairment of goodwill	0	0
– Impairment of intangible assets	0	0
– Legal and environmental cases	19	46
Total costs	**926**	**1,254**

Global restructuring plans: classification of costs in millions of CHF

	2018			2017		
	Depreciation, amortisation and impairment	Other costs	Total	Depreciation, amortisation and impairment	Other costs	Total
Royalties and other operating income						
– Pharmaceuticals	–	0	0	–	0	0
– Diagnostics	–	(16)	(16)	–	0	0
Cost of sales						
– Pharmaceuticals	107	185	292	203	174	377
– Diagnostics	8	100	108	32	75	107
Marketing and distribution						
– Pharmaceuticals	0	97	97	1	233	234
– Diagnostics	0	71	71	1	91	92
Research and development						
– Pharmaceuticals	1	75	76	0	21	21
– Diagnostics	(4)	38	34	0	66	66
General and administration						
– Pharmaceuticals	0	70	70	0	291	291
– Diagnostics	1	44	45	3	24	27
– Corporate	0	149	149	0	39	39
Total	**113**	**813**	**926**	**240**	**1,014**	**1,254**
Total by operating segment						
– Roche Pharmaceuticals	108	427	535	204	719	923
– Chugai	–	–	–	–	–	–
– Diagnostics	5	237	242	36	256	292
– Corporate	0	149	149	0	39	39
Total	**113**	**813**	**926**	**240**	**1,014**	**1,254**

8. Property, plant and equipment

Property, plant and equipment: movements in carrying value of assets in millions of CHF

	Land	Buildings and land improvements	Machinery and equipment	Construction in progress	Total
At 1 January 2017					
Cost	981	14,772	19,723	3,671	39,147
Accumulated depreciation and impairment	(3)	(6,212)	(12,946)	(29)	(19,190)
Net book value	**978**	**8,560**	**6,777**	**3,642**	**19,957**
Year ended 31 December 2017					
At 1 January 2017	978	8,560	6,777	3,642	19,957
Additions	0	272	1,135	2,070	3,477
Disposals	(3)	(26)	(73)	(4)	(106)
Divestment of subsidiaries [23]	(3)	0	0	0	(3)
Transfers	24	1,322	975	(2,321)	–
Depreciation charge	–	(645)	(1,551)	–	(2,196)
Impairment charge	(1)	(46)	(178)	(8)	(233)
Other	0	0	(57)	0	(57)
Currency translation effects	(15)	(28)	65	51	73
At 31 December 2017	**980**	**9,409**	**7,093**	**3,430**	**20,912**
Cost	980	15,602	19,982	3,445	40,009
Accumulated depreciation and impairment	0	(6,193)	(12,889)	(15)	(19,097)
Net book value	**980**	**9,409**	**7,093**	**3,430**	**20,912**
Year ended 31 December 2018					
At 1 January 2018	980	9,409	7,093	3,430	20,912
Business combinations	0	0	3	0	3
Additions	358	91	1,072	2,275	3,796
Disposals	(2)	(14)	(118)	(2)	(136)
Divestment of subsidiaries [23]	0	0	0	0	0
Transfers	44	1,298	1,018	(2,360)	–
Depreciation charge	–	(697)	(1,595)	–	(2,292)
Impairment charge	0	(12)	(115)	(14)	(141)
Other	0	0	(92)	(11)	(103)
Currency translation effects	4	(62)	(132)	(31)	(221)
At 31 December 2018	**1,384**	**10,013**	**7,134**	**3,287**	**21,818**
Cost	1,384	16,707	20,437	3,294	41,822
Accumulated depreciation and impairment	0	(6,694)	(13,303)	(7)	(20,004)
Net book value	**1,384**	**10,013**	**7,134**	**3,287**	**21,818**

Classification of impairment of property, plant and equipment in millions of CHF

	2018	2017
Cost of sales	(130)	(210)
Marketing and distribution	0	(1)
Research and development	1	(1)
General and administration	(12)	(21)
Total impairment charge	**(141)**	**(233)**

Impairment charges for property, plant and equipment were mainly related to global restructuring plans (see Note 7).

In 2018 no reimbursements were received from insurance companies in respect of impairments to property, plant and equipment (2017: none). In 2018 no borrowing costs were capitalised as property, plant and equipment (2017: none).

Genentech property purchase option exercise in 2015

In 2004 Genentech entered into a Master Lease Agreement ('MLA') with Slough SSF LLC ('Slough'), which was subsequently acquired by Health Care Properties, for the lease of property adjacent to Genentech's South San Francisco site, which was to be developed by Slough. The development included a total of eight buildings and construction was completed during 2008, at which time Genentech fully occupied the property. The property lease was until 2020 with extension options to 2030. On 1 November 2015 Genentech exercised a purchase option contained in the MLA to acquire the eight buildings and land. At 31 December 2015 the Group recorded an addition to 'land' and 'buildings and land improvements' and corresponding liabilities for the cash outflows in 2016 and 2018. The Group also reclassified the finance lease accounting balances that previously applied to these buildings. In November 2016 the first closing payment of USD 311 million was made. The final closing payment of USD 269 million was made in June 2018 (see Note 19).

Leasing arrangements where the Group is the lessee

Finance leases. At 31 December 2018 the capitalised cost of property, plant and equipment under finance leases was CHF 12 million (2017: CHF 11 million) and the net book value of these assets was CHF 5 million (2017: CHF 5 million). The carrying value of the leasing obligation was CHF 4 million (2017: CHF 5 million), which is reported as part of Debt (see Note 21).

Finance leases: future minimum lease payments under non-cancellable leases in millions of CHF

	Future minimum lease payments		Present value of minimum lease payments	
	2018	2017	2018	2017
Within one year	2	1	2	1
Between one and five years	2	4	2	4
More than five years	0	0	0	0
Total	**4**	**5**	**4**	**5**
Future finance charges	0	0	0	0
Total future minimum lease payments (undiscounted)	**4**	**5**	**4**	**5**

Operating leases. Group companies are party to a number of operating leases, mainly for property rentals and motor vehicles. The arrangements do not impose any significant restrictions on the Group. Total operating lease rental expense was CHF 494 million (2017: CHF 461 million).

Operating leases: future minimum lease payments under non-cancellable leases in millions of CHF

	2018	2017
Within one year	364	366
Between one and five years	750	752
More than five years	216	228
Total minimum payments	**1,330**	**1,346**

Leasing arrangements where the Group is the lessor

Finance leases. Certain assets, mainly Diagnostics instruments, are leased to third parties through finance lease arrangements. Such assets are reported as receivables at an amount equal to the net investment in the lease. Lease income from finance leases is recognised over the term of the lease based on the effective interest rate method.

Finance leases: future minimum lease receipts under non-cancellable leases in millions of CHF

	Gross investment in lease		Present value of minimum lease receipts	
	2018	2017	2018	2017
Within one year	45	40	38	36
Between one and five years	101	93	95	84
More than five years	3	5	3	5
Total	**149**	**138**	**136**	**125**
Unearned finance income	(13)	(12)	n/a	n/a
Unguaranteed residual value	n/a	n/a	0	1
Net investment in lease	**136**	**126**	**136**	**126**

The accumulated allowance for uncollectible minimum lease payments was nil (2017: CHF 1 million).

Operating leases. Certain assets, mainly Diagnostics instruments, are leased to third parties through operating lease arrangements. Such assets are reported within property, plant and equipment. Lease income from operating leases is recognised over the lease term on a straight-line basis.

At 31 December 2018 machinery and equipment with an original cost of CHF 5.2 billion (2017: CHF 4.8 billion) and a net book value of CHF 1.7 billion (2017: CHF 1.7 billion) was being leased to third parties.

Operating leases: future minimum lease receipts under non-cancellable leases in millions of CHF

	2018	2017
Within one year	127	57
Between one and five years	239	94
More than five years	11	3
Total minimum receipts	**377**	**154**

Implementation of IFRS 16 'Leases'

The Group will implement the new standard effective 1 January 2019. IFRS 16 will replace existing leases guidance, including IAS 17 'Leases', and sets out the principles for recognition and measurement of leases. See Note 33 for further details.

Capital commitments

The Group has non-cancellable capital commitments for the purchase or construction of property, plant and equipment totalling CHF 1.3 billion (2017: CHF 1.2 billion).

9. Goodwill

Goodwill: movements in carrying value of assets in millions of CHF

	2018	2017
At 1 January		
Cost	12,461	12,655
Accumulated impairment	(2,384)	(1,373)
Net book value	**10,077**	**11,282**
Year ended 31 December		
At 1 January	10,077	11,282
Business combinations [6]	1,128	104
Divestment of subsidiaries [23]	(5)	0
Impairment charge	(2,254)	(1,058)
Currency translation effects	2	(251)
At 31 December	**8,948**	**10,077**
Cost	12,836	12,461
Accumulated impairment	(3,888)	(2,384)
Net book value	**8,948**	**10,077**
Allocated to the following cash-generating units		
Roche Pharmaceuticals	3,421	4,677
Foundation Medicine	–	97
Pharmaceuticals product transactions	363	–
Chugai	99	96
Total Pharmaceuticals Division	**3,883**	**4,870**
Diabetes Care	876	880
Centralised and Point of Care Solutions	1,618	1,730
Molecular Diagnostics	381	379
Tissue Diagnostics	0	0
Sequencing	0	0
Divisional goodwill	2,190	2,218
Total Diagnostics Division	**5,065**	**5,207**

Cash-generating units used for allocating goodwill

Pharmaceuticals Division. During 2018 the Group made a comprehensive reassessment of the cash-generating units used for allocating goodwill in the Pharmaceuticals Division. This reassessment was made in light of the following factors:

- Ongoing business transformations within the Pharmaceuticals Division during 2018.
- The acquisition of Flatiron Health effective April 2018 and the transaction to fully acquire Foundation Medicine effective July 2018.
- The early adoption of the amendments to IFRS 3 'Business Combinations' that were issued in October 2018. These amendments further clarify the definition of a business and whether a transaction represents in substance the purchase of a business or a single asset or group of similar assets.

The conclusions of this reassessment were as follows:
- Within the Roche Pharmaceuticals operating segment, goodwill arises from three broad types of transactions:
  - Strategic transactions that have a transformative effect across the whole division.
  - Technology transactions, where the acquired technologies can have a range of areas of applications.
  - Product transactions, where the acquired products typically have more limited synergistic benefits outside of the immediate product therapeutic area.
- The cash-generating unit for the goodwill arising from strategic transactions will be the Roche Pharmaceuticals operating segment.
- The cash-generating unit for the goodwill arising from technology transactions will also be the Roche Pharmaceuticals operating segment. However, if the acquired technologies permanently cease to operate then this will be treated as a disposal of the business; in such cases the goodwill will be deemed to have been disposed of and will be fully impaired.
- The cash-generating unit for the goodwill arising from product transactions will be the smallest identifiable group of assets related to the revenues and related costs that arise from the development and commercialisation of the product(s) in question. Where there are synergistic benefits to other products in the same therapeutic area, then the revenues, costs and corresponding assets of these other products will also be taken into account. If the acquired products permanently cease to generate economic benefits then this will be treated as a disposal of the business; in such cases the goodwill will be deemed to have been disposed of and will be fully impaired.
- Chugai remains as a separate operating segment in the Group's financial reporting and remains a separate cash-generating unit to which goodwill is allocated.

Based on the above reassessment the Group allocated the remaining goodwill in the Roche Pharmaceuticals operating segment as listed below. The basis for the reallocation were the historical amounts of goodwill that arose from the individual transactions.
- Strategic transactions consist of Genentech (1990/1999), Foundation Medicine (2015) and Flatiron Health (2018).
- Technology transactions consist of Therapeutic Human Polyclonals (2007), Dutalys (2014) and Santaris (2014).
- Product transactions consist of GlycArt (2005), Tanox (2007), InterMune (2014) and Trophos (2015).

Diagnostics Division. The division's business areas and the sequencing business are the cash-generating units used for the testing of goodwill. The goodwill arising from the Corange/Boehringer Mannheim acquisition and part of the goodwill from the Ventana acquisition is recorded and monitored at a divisional level as it relates to the strategic development of the whole division and cannot be meaningfully allocated to the division's business areas. Therefore the cash-generating unit for this goodwill is the entire division. The goodwill arising from the Viewics acquisition is monitored at the divisional level. The recoverable amount used in the impairment testing is based on value in use.

Impairment charge – 2018

Pharmaceuticals Division. The assessment for the potential impairment of goodwill in the Pharmaceuticals Division was carried out using the cash generating units as set out above. During 2018 impairment charges totalling CHF 2,147 million were recorded in the Pharmaceuticals Division.

InterMune acquisition. A charge of CHF 2,040 million was recorded for the full write-off of goodwill from the InterMune acquisition made in 2014. The main product acquired in the original transaction was InterMune's medicine for idiopathic pulmonary fibrosis, Esbriet. Idiopathic pulmonary fibrosis is a progressive disease, which causes scarring of the lungs and has a survival rate of two to three years from diagnosis.

During 2017 the Group recorded an impairment charge of CHF 1,664 million for the partial impairment of the Esbriet product intangible in use. The main factor leading to this was a decrease in forecasted cash flows relative to the previous year's long-term forecast due to a reduction in sales expectations. During 2018 the Group reviewed the assets and liabilities that were acquired in 2014 from the InterMune transaction in detail including the initial valuations, the reports made for the purposes of the acquisition accounting and subsequent integration process. The conclusion of this review was that, apart from the intangible asset representing the acquired rights to Esbriet and the related deferred taxation liabilities, there were no other assets or liabilities recorded on the Group's balance sheet, no other revenue streams and no other parts of the acquired company that had any synergistic benefits for the continued operations of the Roche Group.

During 2018 the Group made the required assessment for the potential impairment of goodwill that arose from the InterMune acquisition using as the cash-generating unit the identifiable group of assets related to the revenues and related costs that arose from the development and commercialisation of Esbriet. As part of the Group's regular process the value in use of the intangible asset representing the acquired rights to Esbriet was first tested for impairment (see Note 10). As a second step the goodwill from the InterMune acquisition was then tested for impairment. The conclusion of these impairment tests were:

- In substance the remaining value to the Group from the InterMune acquisition is estimated at CHF 2,413 million. This solely relates to the acquired rights to Esbriet and should be reported in the Group's balance sheet as a product intangible asset in use.
- The previously recorded impairment on the Esbriet product intangible asset in use was therefore partially reversed and an income of CHF 274 million was recorded for this. The asset concerned was written up to its estimated recoverable value of CHF 2,413 million. The main factor leading to this was an increase in forecasted cash flows relative to the previous year's long-term forecast due to an improvement in sales expectations. The intangible asset continues to be amortised over its remaining estimated useful life of three years (see also Note 10).
- A full impairment of CHF 2,040 million was recorded for the goodwill from the InterMune acquisition. The revenues and related costs arising from the development and commercialisation of Esbriet are fully utilised in the impairment testing process to support the value in use of the Esbriet product intangible asset in use. There is no surplus from Esbriet revenues to support the carrying value of the goodwill, neither are there any synergistic benefits to other products in the same therapeutic area. Accordingly the separable recoverable value of this goodwill is estimated to be zero and it has been fully impaired.

Trophos acquisition. A charge of CHF 107 million was recorded for the full write-off of goodwill from the Trophos acquisition made in 2015. The main product acquired in the original transaction was Trophos' proprietary screening platform-generated olesoxime (TRO19622), which was being developed for spinal muscular atrophy (SMA), a rare and debilitating genetic neuromuscular disease that is most commonly diagnosed in children. During 2018 the Group decided to stop development of this compound. Therefore there are no potential future revenues to support the carrying value of the goodwill, neither are there any synergistic benefits to other products in the same franchise. Accordingly the intangible assets relating to this product were fully impaired (see Note 10) and the goodwill is deemed to have been disposed of and has also been fully impaired.

Diagnostics Division. A charge of CHF 107 million was recorded in the Centralised and Point of Care business area for the full write-off of goodwill from the CMI acquisition made in 2013. During 2018 the Group decided to change the commercialisation strategy for diagnostic instruments used in haematology testing. This led to a full impairment of the product intangibles in use acquired as part of the CMI acquisition (see Note 10). Therefore the goodwill is deemed to have been disposed of and has also been fully impaired.

Impairment charge – 2017

During 2017 impairment charges totalling CHF 1,058 million were recorded which related to:

- A charge of CHF 674 million in the Diagnostics Division for the full write-off of the sequencing business goodwill. The factors leading to this impairment were: (i) a decrease in forecasted cash flows relative to the previous year's long-term forecast due to changed assumptions around market penetration, pricing and reimbursement; and (ii) a revised time to market of the single molecule sequencing technology. In addition impairment charges of CHF 120 million were recorded for sequencing business product intangibles in use acquired as part of the Ariosa acquisition (see Note 10).
- A charge of CHF 384 million in the Pharmaceuticals Division for the full write-off of the goodwill relating to the Seragon acquisition due to the decision to stop development of the back-up compound acquired.

Value in use

Value in use is calculated using a discounted expected cash flow approach, with a post-tax discount rate applied to the projected risk-adjusted post-tax cash flows and terminal value. The discount rate is the Group's weighted average cost of capital as the cash-generating units have integrated operations across large parts of the Group. It is derived from a capital asset pricing model using data from capital markets, including government twenty-year bonds. For assessing value in use, the cash flow projections are based on the most recent long-term forecasts approved by management. The long-term forecasts include management's latest estimates on sales volume and pricing, as well as production and other operating costs and assume no significant changes in the organisation. Other key assumptions used in the calculations are the period of cash flow projections included in the long-term forecasts, the terminal value growth rate and the discount rate.

Key assumptions used in value-in-use calculations

	2018			2017		
	Period of cash flow projections	Terminal value growth rate	Discount rate (after tax)	Period of cash flow projections	Terminal value growth rate	Discount rate (after tax)
Pharmaceuticals Division	5 years	n/a	7.5%	5 years	n/a	6.8%
Diagnostics Division	5 years	1.5%	7.5%	5 years	1.5%	6.8%

For cash-generating units with a terminal value growth, the respective rate does not exceed the long-term projected growth rate for the relevant market.

Fair value less costs of disposal

For goodwill arising from the Chugai acquisition, the fair value less costs of disposal is determined with reference to the publicly quoted price of Chugai shares.

Sensitivity analysis

Management has performed sensitivity analyses for Roche Pharmaceuticals and the Diagnostics Division, which increased the discount rate by 1% combined with decreasing the forecast cash flows by 5%, and for Chugai, which decreased the publicly quoted share prices by 5%. The results of the sensitivity analyses demonstrated that the above changes in the key assumptions would not cause the carrying values of goodwill to exceed the recoverable amounts at 31 December 2018.

10. Intangible assets

Intangible assets: movements in carrying value of assets in millions of CHF

	Product intangibles: in use	Product intangibles: not available for use	Marketing intangibles: in use	Technology intangibles: in use	Total
At 1 January 2017					
Cost	23,579	5,795	66	1,057	30,497
Accumulated amortisation and impairment	(15,119)	(2,476)	(29)	(827)	(18,451)
Net book value	**8,460**	**3,319**	**37**	**230**	**12,046**
Year ended 31 December 2017					
At 1 January 2017	8,460	3,319	37	230	12,046
Business combinations [6]	60	0	29	0	89
Additions	75	644	12	38	769
Disposals	0	0	0	0	0
Transfers	467	(501)	0	34	–
Amortisation charge	(1,592)	–	(9)	(90)	(1,691)
Impairment charge	(1,784)	(676)	0	0	(2,460)
Currency translation effects	(267)	(114)	1	(5)	(385)
At 31 December 2017	**5,419**	**2,672**	**70**	**207**	**8,368**
Cost	22,425	5,626	109	1,094	29,254
Accumulated amortisation and impairment	(17,006)	(2,954)	(39)	(887)	(20,886)
Net book value	**5,419**	**2,672**	**70**	**207**	**8,368**
Allocated by operating segment					
Roche Pharmaceuticals	4,047	2,025	2	140	6,214
Chugai	27	58	27	0	112
Diagnostics	1,345	589	41	67	2,042
Total Group	**5,419**	**2,672**	**70**	**207**	**8,368**
Year ended 31 December 2018					
At 1 January 2018	5,419	2,672	70	207	8,368
Business combinations [6]	608	0	87	0	695
Asset acquisitions [6]	0	1,725	0	0	1,725
Additions	156	504	23	137	820
Disposals	0	0	0	0	0
Transfers	442	(442)	0	0	–
Amortisation charge	(1,174)	–	(36)	(84)	(1,294)
Impairment charge	(303)	(763)	0	(16)	(1,082)
Currency translation effects	32	80	2	0	114
At 31 December 2018	**5,180**	**3,776**	**146**	**244**	**9,346**
Cost	23,594	5,871	220	1,235	30,920
Accumulated amortisation and impairment	(18,414)	(2,095)	(74)	(991)	(21,574)
Net book value	**5,180**	**3,776**	**146**	**244**	**9,346**
Allocated by operating segment					
Roche Pharmaceuticals	4,449	3,482	67	209	8,207
Chugai	22	24	44	0	90
Diagnostics	709	270	35	35	1,049
Total Group	**5,180**	**3,776**	**146**	**244**	**9,346**

Significant intangible assets at 31 December 2018 in millions of CHF

	Operating segment	Net book value	Remaining amortisation period
Product intangibles in use			
Esbriet (InterMune acquisition)	Roche Pharmaceuticals	2,413	3 years
Flatiron Health acquisition	Roche Pharmaceuticals	585	14 years
Shionogi licence transaction	Roche Pharmaceuticals	356	17 years
Foundation Medicine acquisition	Roche Pharmaceuticals	334	6 years
Kapa acquisition	Diagnostics	245	12 years
IQuum acquisition	Diagnostics	180	15 years
Product intangibles not available for use			
Entrectinib (Ignyta acquisition)	Roche Pharmaceuticals	1,664	n/a
BioNTech licence transaction	Roche Pharmaceuticals	305	n/a
GeneWeave acquisition	Diagnostics	269	n/a
Technology intangibles in use			
Dutalys acquisition	Roche Pharmaceuticals	43	2 years

Classification of intangible asset amortisation and impairment expenses in millions of CHF

	Amortisation		Impairment	
	2018	2017	2018	2017
Cost of sales				
– Pharmaceuticals	(969)	(1,230)	274	(1,664)
– Diagnostics	(142)	(315)	(568)	(120)
Marketing and distribution				
– Pharmaceuticals	(32)	(6)	0	0
– Diagnostics	(4)	(3)	0	0
Research and development				
– Pharmaceuticals	(130)	(123)	(507)	(524)
– Diagnostics	(17)	(14)	(281)	(152)
Total	**(1,294)**	**(1,691)**	**(1,082)**	**(2,460)**

Internally generated intangible assets

The Group currently has no internally generated intangible assets from development as the criteria for the recognition as an asset are not met.

Intangible assets with indefinite useful lives

The Group currently has no intangible assets with indefinite useful lives.

Intangible assets not available for use

These mostly represent in-process research and development assets acquired either through in-licensing arrangements, business combinations, asset acquisitions or separate purchases. At 31 December 2018 approximately 71% (2017: 68%) of the projects in the Pharmaceuticals Division have known decision points within the next twelve months which in certain circumstances could lead to impairment. Due to the inherent uncertainties in the research and development processes, intangible assets not available for use are particularly at risk of impairment if the project is not expected to result in a commercialised product.

Intangible asset impairment

Impairment charges arise from changes in the estimates of the future cash flows expected to result from the use of the asset and its eventual disposal. Factors such as the presence or absence of competition, technical obsolescence or lower-than-anticipated sales for products with capitalised rights could result in shortened useful lives or impairment.

Impairment charges – 2018

Pharmaceuticals Division. Impairment charges totalling CHF 233 million, net of impairment reversals, were recorded which related to:

- A charge of CHF 197 million due to the decision to stop the development of five different compounds with five different alliance partners. The assets concerned, which were not yet being amortised, were fully written down.
- A charge of CHF 122 million due to the decision to stop the development of a compound purchased separately. The asset concerned, which was not yet being amortised, was fully written down.
- A charge of CHF 100 million due to the decision to stop the development of the compound acquired as part of the Trophos acquisition. The asset concerned, which was not yet being amortised, was fully written down.
- A charge of CHF 66 million for the partial impairment of a compound purchased separately due to a delayed timeline. The asset concerned, which was not yet being amortised, was partially written down.
- A charge of CHF 13 million following a clinical data assessment. The asset concerned, which was not yet being amortised, was fully written down.
- A charge of CHF 9 million for other impairments. The assets concerned, which were not yet being amortised, were fully written down.
- The previously recorded impairment on the Esbriet product intangible asset in use was partially reversed and an income of CHF 274 million was recorded for this. The asset concerned was written up to its estimated recoverable value of CHF 2,413 million. The main factor leading to this was an increase in forecasted cash flows relative to the previous year's long-term forecast due to an improvement in sales expectations. The intangible asset continues to be amortised over its remaining estimated useful life of three years. Goodwill impairment charges related to the InterMune acquisition are discussed in Note 9.

Diagnostics Division. Impairment charges totalling CHF 849 million were recorded which related to:

- A charge of CHF 400 million for the full impairment of intangibles both in use and not available for use related to the sequencing business mainly acquired as part of the Genia, CAPP and Signature acquisitions. The factors leading to this impairment were a change in the commercialisation strategy for related products and a change in timelines for future product development. The assets concerned, which were partly being amortised and partly not yet being amortised, were fully written down.
- A charge of CHF 206 million for the partial impairment of sequencing business product intangibles in use acquired as part of the Ariosa acquisition. The factor leading to this impairment was a decrease in forecasted cash flows following revised sales assumptions. The asset concerned, which was being amortised, was written down to its estimated recoverable value of CHF 89 million.
- A charge of CHF 243 million for the full impairment of Centralised and Point of Care Solutions' product intangibles in use acquired as part of the CMI acquisition as a result of a decision to change the commercialisation strategy for diagnostic instruments used in haematology testing. The asset concerned, which was being amortised, was fully written down.

Impairment charges – 2017

Pharmaceuticals Division. Impairment charges totalling CHF 2,188 million were recorded which related to:

- A charge of CHF 1,664 million for the partial impairment of the Esbriet product intangible in use acquired as part of the InterMune acquisition. The asset concerned was written down to its estimated recoverable value of CHF 2,878 million. The main factor leading to this was a decrease in forecasted cash flows relative to the previous year's long-term forecast due to a reduction in sales expectations. The intangible asset continues to be amortised over its remaining estimated useful life of four years.
- A charge of CHF 195 million due to the launch of a competitor product for the compound acquired as part of the Trophos acquisition. The asset concerned, which was not yet being amortised, was written down to its estimated recoverable value of CHF 101 million.
- A charge of CHF 149 million due to the decision to stop development of one compound with an alliance partner following an assessment of clinical and non-clinical data. The asset concerned, which was not yet being amortised, was fully written down.
- A charge of CHF 74 million due to the decision to stop development of one compound acquired as part of the Dutalys acquisition. The asset concerned, which was not yet being amortised, was fully written down.
- A charge of CHF 47 million due to the decision to stop development of one compound acquired as part of the Santaris acquisition following a clinical data assessment. The asset concerned, which was not yet being amortised, was fully written down.
- A charge of CHF 39 million due to the decision to stop development of two compounds with two different alliance partners. The assets concerned, which were not yet being amortised, were fully written down.
- A charge of CHF 20 million following clinical data assessments. The assets concerned, which were not yet being amortised, were fully written down.

Diagnostics Division. Impairment charges totalling CHF 272 million were recorded which related to:

- A charge of CHF 152 million for the partial impairment of Molecular Diagnostics product intangibles not available for use acquired as part of the GeneWeave acquisition. The factor leading to this partial impairment was a decrease in forecasted cash flows following a change in the timelines for future product development, pricing and penetration rate due to updated market size assumptions. The asset concerned, which was not yet being amortised, was written down to its estimated recoverable value of CHF 268 million.
- A charge of CHF 120 million for the partial impairment of sequencing business product intangibles in use acquired as part of the Ariosa acquisition. The factor leading to this impairment was a decrease in forecasted cash flows following revised assumptions on pricing and penetration rate due to market dynamics. The asset concerned, which was being amortised, was written down to its estimated recoverable value of CHF 312 million.

Potential commitments from alliance collaborations and purchase agreements within the next three years

The Group is party to in-licensing and similar arrangements with its alliance partners and intangible asset purchase agreements with third parties. These arrangements and purchase agreements may require the Group to make certain milestone or other similar payments dependent upon the achievement of agreed objectives or performance targets as defined in the collaboration and purchase agreements.

The Group's current estimate of future third-party commitments for such payments within the next three years is set out in the table below. These figures are undiscounted and are not risk-adjusted, meaning that they include all such potential payments that can arise assuming all projects currently in development are successful. The timing is based on the Group's current best estimate. These figures do not include any potential commitments within the Group, such as may arise between the Roche and Chugai businesses.

Potential future third-party collaboration and purchase payments at 31 December 2018 in millions of CHF

	Pharmaceuticals	Diagnostics	Group
Within one year	363	35	398
Between one and two years	579	6	585
Between two and three years	482	7	489
Total	**1,424**	**48**	**1,472**

11. Inventories

Inventories in millions of CHF

	2018	2017	2016
Raw materials and supplies	1,206	1,182	1,194
Work in process	117	101	114
Intermediates	4,269	4,660	5,372
Finished goods	1,651	2,052	1,880
Provision for slow-moving and obsolete inventory	(622)	(588)	(632)
Total inventories	**6,621**	**7,407**	**7,928**

Inventories expensed through cost of sales totalled CHF 12.1 billion (2017: CHF 11.3 billion). Inventory write-downs during the year resulted in an expense of CHF 751 million (2017: CHF 663 million).

12. Accounts receivable

Accounts receivable in millions of CHF

	2018	2017	2016
Trade receivables	10,663	10,371	9,416
Notes receivable	96	102	83
Other receivables	38	36	34
Allowances for doubtful accounts	(540)	(517)	(538)
Chargebacks and other allowances to be withheld upon settlement [3]	(481)	(415)	(235)
Total accounts receivable [3]	**9,776**	**9,577**	**8,760**

Allowances for doubtful accounts: movements in recognised allowance in millions of CHF

	2018	2017
At 1 January	(517)	(538)
Implementation of IFRS 9 'Financial Instruments' [33]	(6)	n/a
At 1 January (revised)	(523)	n/a
Additional allowances created	(117)	(91)
Unused amounts reversed	60	77
Utilised during the year	21	43
Currency translation effects	19	(8)
At 31 December	**(540)**	**(517)**

Bad debt expenses recorded as marketing and distribution costs totalled CHF 47 million (2017: expense of CHF 12 million).

13. Marketable securities

Upon transition to IFRS 9 (see Note 33) the Group elected not to restate comparative information. As a result the information provided below for the current period is on the IFRS 9 basis and the comparative information is on the IAS 39 basis.

Marketable securities in millions of CHF

	2018 (IFRS 9)	2017 (IAS 39)	2016 (IAS 39)
Equity securities (available-for-sale IAS 39)	n/a	10	69
Equity securities at fair value through profit or loss (IFRS 9)	9	n/a	n/a
Debt securities (available-for-sale IAS 39)	n/a	1,161	1,509
Debt securities at fair value through OCI (IFRS 9)	1,047	n/a	n/a
Money market instruments and time accounts over three months (available-for-sale IAS 39)	n/a	6,107	3,366
Money market instruments at fair value through OCI (IFRS 9)	3,198	n/a	n/a
Time accounts over three months at amortised costs (IFRS 9)	2,183	n/a	n/a
Total marketable securities	**6,437**	**7,278**	**4,944**

Marketable securities are held for fund management purposes and are primarily denominated in US dollars, euros and in Swiss francs. Money market instruments are contracted to mature within one year of 31 December 2018.

Debt securities – contracted maturity in millions of CHF

	2018 (IFRS 9)	2017 (IAS 39)	2016 (IAS 39)
Within one year	170	217	364
Between one and five years	835	867	906
More than five years	42	77	239
Total debt securities	**1,047**	**1,161**	**1,509**

14. Cash and cash equivalents

Cash and cash equivalents in millions of CHF

	2018	2017	2016
Cash – cash in hand and in current or call accounts	4,139	3,419	3,304
Cash equivalents – time accounts with a maturity of three months or less	2,542	1,300	859
Total cash and cash equivalents	**6,681**	**4,719**	**4,163**

15. Other non-current assets

Upon transition to IFRS 9 (see Note 33) the Group elected not to restate comparative information. As a result the information provided below for the current period is on the IFRS 9 basis and the comparative information is on the IAS 39 basis.

Other non-current assets in millions of CHF

	2018	2017	2016
Available-for-sale investments – held at fair value (IAS 39) [30]	n/a	294	249
Available-for-sale investments – held at cost (IAS 39)	n/a	252	279
Equity investments at fair value through OCI (IFRS 9) [30]	102	n/a	n/a
Equity investments at fair value through profit or loss (IFRS 9) [30]	458	n/a	n/a
Loans receivable	8	8	7
Restricted cash	2	2	2
Other receivables – contracts with customers [3]	25	38	27
Other receivables	99	91	88
Total financial non-current assets	**694**	**685**	**652**
Long-term employee benefits	225	249	254
Other assets	428	400	394
Total non-financial non-current assets	**653**	**649**	**648**
Associates [23]	42	36	0
Total other non-current assets	**1,389**	**1,370**	**1,300**

Equity investments designated at fair value through OCI are mainly investments in private companies from the pharmaceutical sector, which are held as part of the Group's strategic alliance efforts. Equity investments were classified as available-for-sale in 2017 and 2016.

16. Other current assets

Other current assets in millions of CHF

	2018	2017	2016
Accrued interest income	45	45	51
Derivative financial instruments [30]	138	97	185
Restricted cash	10	0	8
Cash collateral receivables	86	50	337
Other receivables – contracts with customers [3]	604	628	749
Other receivables	196	173	19
Total financial current assets	**1,079**	**993**	**1,349**
Prepaid expenses and accrued income	683	559	544
Other taxes recoverable	572	516	482
Other assets	187	175	165
Total non-financial current assets	**1,442**	**1,250**	**1,191**
Total other current assets	**2,521**	**2,243**	**2,540**

17. Accounts payable

Accounts payable in millions of CHF

	2018	2017	2016
Trade payables	2,847	2,786	2,689
Other taxes payable	442	418	402
Dividends payable	2	2	2
Other payables	235	248	282
Total accounts payable	**3,526**	**3,454**	**3,375**

18. Other non-current liabilities

Other non-current liabilities in millions of CHF

	2018	2017	2016
Deferred income	31	86	91
Other long-term liabilities	157	120	441
Total other non-current liabilities	**188**	**206**	**532**

Other long-term liabilities are mainly related to accrued employee benefits and included (in 2016) the Genentech property purchase option exercise obligation paid in June 2018 (see Note 8).

19. Other current liabilities

Other current liabilities in millions of CHF

	2018	2017	2016
Deferred income	290	372	184
Accrued payroll and related items	3,085	2,853	2,356
Interest payable	221	218	289
Derivative financial instruments [30]	153	119	447
Cash collateral payables	80	11	35
Accrued chargebacks and other allowances separately payable [3]	2,807	2,242	1,704
Accrued royalties and commissions	1,135	1,148	974
Other accrued liabilities	2,906	3,172	2,889
Total other current liabilities	**10,677**	**10,135**	**8,878**

At 31 December 2017 other accrued liabilities included CHF 261 million for the short-term Genentech property purchase option exercise obligation, which was paid in June 2018 (see Note 8).

20. Provisions and contingent liabilities

Provisions: movements in recognised liabilities in millions of CHF

	Legal provisions	Environmental provisions	Restructuring provisions	Contingent consideration provisions	Other provisions	Total
Year ended 31 December 2017						
At 1 January 2017	705	518	674	1,089	1,062	4,048
Additional provisions created	60	68	543	13	523	1,207
Unused amounts reversed	(219)	(4)	(167)	(366)	(181)	(937)
Utilised	(37)	(81)	(259)	(146)	(249)	(772)
Discount unwind [4]	0	4	0	14	2	20
Business combinations						
– Acquired companies	0	0	0	0	0	0
– Deferred consideration [6]	–	–	–	–	8	8
– Contingent consideration [6]	–	–	–	10	–	10
Currency translation effects	(24)	18	31	(23)	4	6
At 31 December 2017	**485**	**523**	**822**	**591**	**1,169**	**3,590**
Current	471	119	450	182	820	2,042
Non-current	14	404	372	409	349	1,548
At 31 December 2017	**485**	**523**	**822**	**591**	**1,169**	**3,590**
Year ended 31 December 2018						
At 1 January 2018	485	523	822	591	1,169	3,590
Additional provisions created	133	33	624	51	866	1,707
Unused amounts reversed	(15)	(3)	(111)	(130)	(336)	(595)
Utilised	(24)	(61)	(451)	(14)	(351)	(901)
Discount unwind [4]	0	9	0	15	2	26
Business combinations						
– Acquired companies	0	0	0	0	2	2
– Deferred consideration	–	–	–	–	0	0
– Contingent consideration	–	–	–	0	–	0
Asset acquisitions	1	0	0	0	0	1
Divestment of subsidiaries [23]	(1)	0	0	0	(10)	(11)
Currency translation effects	(1)	(10)	(16)	(2)	(9)	(38)
At 31 December 2018	**578**	**491**	**868**	**511**	**1,333**	**3,781**
Current	570	83	535	180	961	2,329
Non-current	8	408	333	331	372	1,452
At 31 December 2018	**578**	**491**	**868**	**511**	**1,333**	**3,781**
Expected outflow of resources						
Within one year	570	83	535	180	961	2,329
Between one and two years	4	116	153	22	36	331
Between two and three years	1	106	112	144	67	430
More than three years	3	186	68	165	269	691
At 31 December 2018	**578**	**491**	**868**	**511**	**1,333**	**3,781**

In 2018 CHF 901 million of provisions were utilised (2017: CHF 772 million), of which CHF 883 million (2017: CHF 621 million) are included in the cash flows from operating activities and CHF 18 million (2017: CHF 151 million) are included in the cash flows from business combinations for payments made from deferred and contingent consideration arrangements (see Note 6).

Legal provisions

Legal provisions consist of a number of separate legal matters, including claims arising from trade, in various Group companies. By their nature the amounts and timings of any outflows are difficult to predict.

As part of the regular review of litigation matters, management has reassessed the provisions recorded for certain litigation matters. Based on the development of the various litigations, there was a net increase in provisions of CHF 118 million which was a major element in the 2018 legal expenses of CHF 128 million (2017: net income of CHF 142 million). Details of the major legal cases outstanding are disclosed below.

Environmental provisions

Provisions for environmental matters include various separate environmental issues in a number of countries. By their nature the amounts and timings of any outflows are difficult to predict. Significant provisions are discounted by between 2% and 4% where the time value of money is material. The significant provisions relate to the US site in Nutley, New Jersey, which was divested in September 2016, the estimated remediation costs for a landfill site near Grenzach, Germany, that was used by manufacturing operations that were closed some years ago and the estimated remediation costs for the manufacturing site at Clarecastle, Ireland. In 2018 the expected costs of environmental remediation at the Clarecastle site and other matters were reassessed. Accordingly in 2018 environmental provisions increased by CHF 30 million, net. The net environmental expenses were CHF 31 million (2017: net expense of CHF 62 million).

The Group's procedures on environmental protection are included in the Annual Report on pages 78 to 87. These include the actions taken by the Group with regard to climate change, notably the Group's commitment to reduce greenhouse gas emissions.

Restructuring provisions

These arise from planned programmes that materially change the scope of business undertaken by the Group or the manner in which business is conducted. Such provisions include only the costs necessarily entailed by the restructuring which are not associated with the recurring activities of the Group. The timings of these cash outflows are reasonably certain. These provisions are not discounted as the time value of money is not material in these matters.

In the Pharmaceuticals Division the significant provisions relate to the strategic realignment of the manufacturing network, the resourcing flexibility plans to address various future challenges including biosimilar competition, the research and development strategic alignment and the outsourcing of IT functions to shared service centres and external providers. In the Diagnostics Division the significant provisions are associated with programmes to address long-term strategy. Further details are given in Note 7.

Contingent consideration provisions

The Group is party to certain contingent consideration arrangements arising from business combinations. Significant provisions are discounted using an average discount rate of 3.6% (2017: 3.1%) where the time value of money is material. Additional details on measurement, on main movements of the provisions and on the total potential payments under these arrangements are provided in Note 30.

Other provisions

Other provisions relate to the items shown in the table below. With the exception of employee provisions, the timing of cash outflows is by its nature uncertain.

Other provisions in millions of CHF

	2018	2017	2016
Employee provisions	398	362	345
Sales returns	497	366	436
Other items	438	441	281
Total other provisions	**1,333**	**1,169**	**1,062**

Contingent liabilities

The operations and earnings of the Group continue, from time to time and in varying degrees, to be affected by political, legislative, fiscal and regulatory developments, including those relating to environmental protection, in the countries in which it operates. The industries in which the Group operates are also subject to other risks of various kinds. The nature and frequency of these developments and events, not all of which are covered by insurance, as well as their effect on future operations and earnings, are not predictable.

The Group has entered into strategic alliances with various companies in order to gain access to potential new products or to utilise other companies to help develop the Group's own potential new products. Potential future payments may become due to certain collaboration partners achieving certain milestones as defined in the collaboration agreements. The Group's best estimates of future commitments for such payments are given in Note 10.

Pharmaceuticals legal cases

At 31 December 2018 provisions for legal cases in the Pharmaceuticals Division were CHF 371 million (2017: CHF 369 million). Provisions have been recorded, and in some cases settled, mainly relating to the matters listed below.

Accutane. Hoffmann-La Roche Inc. ('HLR') and various other Roche affiliates have been named as defendants in numerous legal actions in the US and elsewhere relating to the acne medication Accutane. The litigation alleges that Accutane caused certain serious conditions, including, but not limited to, inflammatory bowel disease ('IBD'), birth defects and psychiatric disorders. In 2009 HLR announced that, following a re-evaluation of the portfolio of medicines that are now available from generic manufacturers, rapidly declining brand sales in the US and high costs from personal-injury lawsuits that it continues to defend vigorously, it had decided to immediately discontinue the manufacture and distribution of the product in the US.

All of the actions pending in federal court alleging IBD were consolidated for pre-trial proceedings in a Multi-District Litigation ('MDL') in the US District Court for the Middle District of Florida, Tampa Division. In August 2015 the MDL was closed. During the pendency of the MDL the District Court granted summary judgment in favour of HLR for all of the federal IBD cases that had proceeded and all were affirmed by the US Court of Appeals for the Eleventh Circuit. All of the actions pending in state court in New Jersey alleging IBD were consolidated for pre-trial proceedings in the Superior Court of New Jersey, Law Division, Atlantic County.

In February 2015 the Superior Court of New Jersey, Law Division, Atlantic County, held an eight-day evidentiary hearing on whether plaintiffs' experts can testify that Accutane causes Crohn's disease. On 20 February 2015 the Superior Court barred plaintiffs' experts because their methods did not meet the requirements for scientific reliability. On 8 May 2015 the Superior Court entered an order dismissing with prejudice an agreed-upon list of 2,076 Crohn's disease cases that were subject to the Superior Court's February 2015 order. On 28 July 2017 the New Jersey Appellate Division reversed the order excluding plaintiffs' experts from testifying that Accutane causes Crohn's disease and reinstated the dismissed cases finding that the trial court wrongfully barred plaintiffs' expert witnesses. HLR filed a petition for review to the New Jersey Supreme Court, which was granted on 8 December 2017. On 1 August 2018 the Supreme Court issued its decision on whether plaintiffs' experts can testify that Accutane causes Crohn's disease. The Supreme Court reversed the judgment of the New Jersey Appellate Division and concluded that the trial court properly had excluded the experts thereby dismissing 2,174 cases alleging that Accutane caused plaintiffs' Crohn's disease. Plaintiffs cannot further appeal. All 2,174 Crohn's disease cases were permanently dismissed.

On 12 May 2015 the Superior Court entered an order granting summary judgment and dismissing 18 cases filed by New Jersey residents on the basis that the drug label was adequate as a matter of law since 2002. In July 2015 the Superior Court granted HLR's motion for summary judgment as to the adequacy of the label for post-2002 ingestion cases in 44 other jurisdictions. The Superior Court applied New Jersey law to all of the jurisdictions and granted HLR's motion dismissing approximately 511 cases. In the alternative, the Superior Court applied the home state law and granted summary judgment in 24 jurisdictions and denied it in 20 jurisdictions; this would have resulted in 389 cases being dismissed. On 25 July 2017 the New Jersey Appellate Division affirmed the dismissal of 197 cases and reinstated judgments in 335 cases based on the strength of HLR's warnings after 2002. HLR and the dismissed plaintiffs filed petitions for review to the New Jersey Supreme Court, which was granted on 8 December 2017. On 3 October 2018 the Supreme Court issued its decision on those cases and reversed the judgment of the New Jersey Appellate Division that had reinstated 335 cases on the basis that the drug label was adequate as a matter of law since 2002. Plaintiffs cannot further appeal. 532 cases were permanently dismissed.

In January and October 2016 the Superior Court entered orders granting summary judgment and dismissing 191 cases for failure to prove Accutane proximately caused their ulcerative colitis. The plaintiffs have appealed all of these decisions. During February and March 2017 the Superior Court of New Jersey, Law Division, Atlantic County, held an evidentiary hearing on whether plaintiffs' experts can testify that Accutane causes ulcerative colitis. In April 2017 the Superior Court barred plaintiffs' experts because their methods did not meet the requirements for scientific reliability. In May 2017 the Superior Court entered an order dismissing 3,231 ulcerative colitis cases that were subject to the Superior Court's April 2017 order. The plaintiffs appealed these decisions. Oral argument is expected in 2019.

At 31 December 2018 HLR was defending no pending actions and there are approximately 3,422 cases on appeal. If any cases survive the appeals, additional trials may be scheduled. Individual trial results depend on a variety of factors, including many that are unique to the particular case and therefore the trial results to date may not be predictive of future trial results. The Group continues to defend vigorously the remaining personal injury cases and claims.

Avastin/Lucentis investigations. On 14 February 2013 the Italian Antitrust Authority ('AGCM') announced an investigation to determine whether Roche, Genentech and Novartis had entered into an agreement to restrict competition in the Italian market for drugs, with reference in particular to Avastin (marketed by Roche) and Lucentis (marketed by Novartis). Avastin and Lucentis are two different drugs that were developed and approved for different therapeutic purposes and contain different active pharmaceutical ingredients. On 5 March 2014 the AGCM issued a verdict that alleges that Roche and Novartis colluded to artificially differentiate Avastin and Lucentis in order to foster the sales of Lucentis in Italy. The AGCM fined Roche EUR 90.5 million and Novartis EUR 92 million. Roche appealed the AGCM verdict to the Tribunale Amministrativo Regionale del Lazio ('TAR'). On 2 December 2014 the TAR upheld the decision by the AGCM. Roche strongly disagrees with the verdict of the TAR and has appealed to the Consiglio di Stato. On 30 May 2014 the Italian Ministry of Health notified Roche S.p.A. of its intention to seek damages related to this matter. In July 2014 Roche paid the EUR 90.5 million fine under protest to avoid additional penalty fees and recorded an expense within general and administration. The fine and related interest will be reimbursed if Roche wins the case. On 23 January 2018 the European Court of Justice rendered its decision on five questions which were referred to the European Court of Justice by the Consiglio di Stato. The principles defined in this decision will be used by the Consiglio di Stato to render their final verdict on the case. The outcome of these matters cannot be determined at this time.

PDL-1 inhibitor litigation. On 26 July 2017 Bristol-Myers Squibb Co. ('BMS') filed a lawsuit against Genentech, Inc. ('Genentech') in Delaware. BMS alleges that Genentech's sale of Tecentriq infringes their US Patent No. 9,402,899. BMS is seeking judgment in its favour, a finding of wilfulness and monetary damages. On 4 October 2017 Genentech filed its answer and counterclaims, seeking a declaratory judgment of invalidity of the 9,402,899 patent. The trial date is scheduled for May 2020. The outcome of this matter cannot be determined at this time.

Average Wholesale Prices litigation. HLR and Roche Laboratories Inc. ('RLI'), along with approximately 50 other brand and generic pharmaceutical companies, have been named as defendants in several legal actions in the US relating to the pricing of pharmaceutical drugs and State Medicaid reimbursement. The primary allegation in these litigations is that the pharmaceutical companies misrepresented or otherwise reported inaccurate Average Wholesale Prices ('AWP') and/or Wholesale Acquisition Costs ('WAC') for their drugs, which prices were allegedly relied upon by the states in calculating Medicaid reimbursements to entities such as retail pharmacies. The states, through their respective Attorney General, are seeking repayment of the amounts they claim were over-reimbursed. The time period associated with these cases is 1991 through 2005. At 31 December 2018 HLR and RLI are defending one AWP action filed in the state of New Jersey. HLR and RLI are vigorously defending themselves and no trial date has been set. The outcome of this matter cannot be determined at this time.

Boniva litigation. HLR, Genentech and various other Roche affiliates (collectively 'Roche') have been named as defendants in numerous legal actions in the US and one now dismissed case in Canada relating to the post-menopausal osteoporosis medication Boniva. In these litigations, the plaintiffs allege that Boniva caused either osteonecrosis of the jaw or atypical femoral fractures. At 31 December 2018 Roche is defending approximately 259 actions involving approximately 300 plaintiffs brought in federal and state courts throughout the US for personal injuries allegedly resulting from the use of Boniva. All of these cases are in the early discovery stages of litigation. Individual trial results depend on a variety of factors, including many that are unique to the particular case. Roche is vigorously defending itself in these matters. The outcome of these matters cannot be determined at this time.

In addition, the matters listed below do not currently have provisions recorded, but there are potential future obligations which will be confirmed only by the occurrence or non-occurrence of uncertain future events or where the obligation cannot be measured with sufficient reliability.

Hemlibra (emicizumab) litigation. On 4 May 2017 Baxalta Inc. and Baxalta GmbH (both together 'Baxalta'), subsidiaries of Shire plc., filed a patent infringement and declaratory judgment of patent infringement suit in the US District Court for the District of Delaware, alleging that Genentech and Chugai Pharmaceutical Co., Ltd. ('Chugai') currently or imminently would manufacture, use, sell, offer for sale, or import into the US Hemlibra (emicizumab), which would infringe Baxalta's US Patent No. 7,033,590. Baxalta is seeking a judgment of infringement, injunctive and monetary relief, attorneys' fees, costs and expenses. On 11 May 2017 Genentech was served with the complaint. Genentech's response and counterclaims to the complaint were filed on 30 June 2017. On 19 June 2017 Chugai waived service. On 13 September 2017 Chugai filed a motion to dismiss the complaint for lack of personal jurisdiction. On 14 December 2017 Baxalta filed a request for a preliminary injunction against Genentech only, in which some inhibitor patients would not be subject to any injunction. A hearing was held in the US District Court for the District of Delaware on 13 and 14 June 2018 and during that hearing Baxalta withdrew its request for a preliminary injunction as to the inhibitor patients. On 25 June 2018 Baxalta submitted a new proposed preliminary injunction order, in which Genentech would be permitted to sell Hemlibra to all inhibitor patients, all non-inhibitor patients currently on Hemlibra whether through clinical trials or not, and selected non-inhibitor patients who have an additional 'medically diagnosed condition' which rendered factor VIII therapies impracticable. On 7 August 2018 the US District Court ruled against Baxalta, denying their request for an injunction. On 19 September 2018 Chugai was dismissed from this case. A trial is scheduled for September 2019.

On 28 March 2018, in the case brought by Baxalta against Chugai in Japan, the Tokyo District Court ruled in favour of Chugai, notably that Hemlibra does not infringe Baxalta's patent. On 10 May 2018 Baxalta appealed this decision.

On 16 November 2017 the Food and Drug Administration ('FDA') approved Hemlibra for haemophilia A with inhibitors for use in the US. On 4 October 2018 the FDA approved the use of Hemlibra in the US for treatment in the non-inhibitor patient population. The outcome of this matter cannot be determined at this time.

Securities litigation. On 6 June 2017 a class action was filed in the US District Court for the District of New Jersey against Roche Holding Ltd and two of its current officers. The lawsuit brings claims under the federal securities laws in connection with the Group's public disclosures, in particular with respect to matters relating to two of Roche's drugs, Herceptin and Perjeta. On 24 September 2018 the District Court dismissed the case concluding that there was nothing misleading in those public disclosures. Subsequently plaintiffs filed a second amended complaint. The Group will vigorously defend itself in this matter. The outcome of this matter cannot be determined at this time.

Iraqi Ministry of Health. In October 2017 F. Hoffmann-La Roche Ltd ('FHLR'), Hoffmann-La Roche Inc. ('HLR') and Genentech and certain other pharmaceutical and/or medical device companies were named as defendants in a complaint filed in the Federal District Court for the District of Columbia, US, on behalf of US service-members and their relatives who allege that they were killed or injured in Iraq between 2005 and 2009 (the 'Iraq lawsuit'). The complaint alleges that the defendants violated the US Anti-Terrorism Act and various state laws by providing funding for terrorist organisations through their sales practices pursuant to pharmaceutical and/or medical device contracts with the Iraqi Ministry of Health. In addition FHLR received an inquiry in July 2018 from the US Department of Justice in connection with an anti-corruption investigation relating to activities in Iraq, including interactions with the Iraqi government and certain of the same matters alleged in the Iraq lawsuit. The Group will vigorously defend itself in this matter. The outcome of this matter cannot be determined at this time.

Arbitration against Chugai. In May 2017 Medical Research Council and LifeArc (formerly Medical Research Council Technology) requested arbitration against Chugai Pharmaceutical Co., Ltd. with an arbitrator being appointed on 9 August 2017. In April 2018 United Kingdom Research and Innovation ('UKRI') was established and became the successor in title to the Medical Research Council, and the current claimants in the arbitration are LifeArc and UKRI. Sums are sought from Chugai for alleged breach of obligations under a collaboration agreement dated 15 August 1990 in connection with the development of the humanised anti-human IL-6 receptor monoclonal antibody, Actemra/RoActemra. It is claimed that Chugai is obliged to pay royalties to the claimants pursuant to the collaboration agreement. Chugai considers that the claims are without merit and Chugai will vigorously defend itself in the arbitration. The outcome of this matter cannot be determined at this time.

21. Debt

Debt: movements in carrying value of recognised liabilities in millions of CHF

	2018	2017
At 1 January	**18,960**	**22,355**
Proceeds from issue of bonds and notes	2,252	1,502
Redemption and repurchase of bonds and notes	(2,152)	(3,068)
Increase (decrease) in commercial paper	(199)	(1,258)
Increase (decrease) in other debt	(23)	(385)
Changes from financing cash flows	**(122)**	**(3,209)**
Net (gains) losses on redemption and repurchase of bonds and notes	0	84
Amortisation of debt discount [4]	11	13
Financing costs	**11**	**97**
Business combinations	**0**	**1**
Net foreign currency transaction (gains) losses	(58)	174
Currency translation effects	(19)	(430)
Changes in foreign exchange rates	**(77)**	**(256)**
Changes in fair values of hedging instruments	(2)	(28)
Other changes	0	0
At 31 December	**18,770**	**18,960**
Bonds and notes	18,041	17,986
Commercial paper	578	774
Amounts due to banks and other financial institutions	144	176
Finance lease obligations [8]	4	5
Other borrowings	3	19
Total debt	**18,770**	**18,960**
Long-term debt	16,077	15,839
Short-term debt	2,693	3,121
Total debt	**18,770**	**18,960**

There are no pledges on the Group's assets in connection with debt.

Bonds and notes

Recognised liabilities and effective interest rates of bonds and notes in millions of CHF

	Effective interest rate Underlying instrument	Effective interest rate Including hedging	2018	2017	2016
US dollar notes – fixed rate					
1.35% notes due 29 September 2017, principal USD 0.85 billion (ISIN: US771196BC54)	1.41%	0.78%	–	–	869
2.25% notes due 30 September 2019, principal USD 1.5 billion (ISIN: US771196BA98)	2.34%	1.70%	1,467	1,466	1,545
2.875% notes due 29 September 2021, principal USD 1.3 billion (ISIN: US771196BB71)	2.98%	2.96%	1,278	1,269	1,325
1.75% notes due 28 January 2022, principal USD 0.65 billion (ISIN: US771196BM37)	1.87%	1.96%	634	630	660
3.25% notes due 17 September 2023, principal USD 0.75 billion (ISIN: US771196BN10)	3.32%	n/a	737	–	–
3.35% notes due 30 September 2024, principal USD 1.65 billion (ISIN: US771196BE11)	3.40%	n/a	1,622	1,612	1,685
3.0% notes due 10 November 2025, principal USD 1.0 billion (ISIN: US771196BJ08)	3.14%	n/a	978	971	1,014
2.625% notes due 15 May 2026, principal USD 1.0 billion (ISIN: US771196BK70)	2.78%	n/a	975	969	1,011
2.375% notes due 28 January 2027, principal USD 0.85 billion (ISIN: US771196BL53)	2.54%	n/a	828	822	858
3.625% notes due 17 September 2028, principal USD 0.65 billion (ISIN: US771196BP67)	3.69%	n/a	638	–	–
7.0% notes due 1 March 2039, principal USD 2.5 billion, outstanding USD 1.19 billion (ISIN: USU75000AN65 and US771196AU61)	7.43%	7.39%	1,129	1,120	1,167
4.0% notes due 28 November 2044, principal USD 0.65 billion (ISIN: US771196BH42)	4.16%	n/a	628	624	652
US dollar notes – floating rate					
Notes due 29 September 2017, principal USD 0.3 billion (ISIN: US771196BD38)	0.77%	n/a	–	–	307
Notes due 30 September 2019, principal USD 0.5 billion (ISIN: US771196AZ58)	1.68%	n/a	492	489	511
Euro Medium Term Note programme – fixed rate					
2.0% notes due 25 June 2018, principal EUR 1.0 billion (ISIN: XS0760139773)	2.07%	n/a	–	1,168	1,072
2.0% notes due 13 March 2020, principal USD 0.6 billion (ISIN: XS1197832089)	2.12%	1.86%	583	581	613
6.5% notes due 4 March 2021, principal EUR 1.75 billion, outstanding EUR 1.14 billion (ISIN: XS0415624716)	6.66%	6.96%	1,282	1,328	1,408
0.5% notes due 27 February 2023, principal EUR 0.65 billion (ISIN: XS1371715118)	0.63%	n/a	728	755	692
5.375% notes due 29 August 2023, principal GBP 0.25 billion, outstanding GBP 0.08 billion (ISIN: XS0175478873)	5.46%	n/a	96	100	249
0.875% notes due 25 February 2025, principal EUR 1.0 billion (ISIN: XS1195056079)	0.93%	n/a	1,122	1,165	1,069
Swiss franc bonds – fixed rate					
4.5% bonds due 23 March 2017, principal CHF 1.5 billion (ISIN: CH0039139263)	4.77%	n/a	–	–	1,499
1.0% bonds due 21 September 2018, principal CHF 0.6 billion (ISIN: CH0180513068)	1.04%	0.88%	–	598	602
0.0% bonds due 23 September 2018, principal CHF 0.4 billion (ISIN: CH0358654967)	–0.45%	n/a	–	401	–
1.625% bonds due 23 September 2022, principal CHF 0.5 billion (ISIN: CH0180513183)	1.64%	1.37%	504	502	504
0.1% bonds due 23 September 2024, principal CHF 0.75 billion (ISIN: CH0358654975)	0.11%	–0.09%	750	748	–
0.25% bonds due 24 September 2025, principal CHF 0.5 billion (ISIN: CH0433761308)	0.25%	n/a	500	–	–
0.45% bonds due 23 March 2029, principal CHF 0.35 billion (ISIN: CH0359915409)	0.46%	n/a	350	350	–
0.75% bonds due 24 September 2030, principal CHF 0.4 billion (ISIN: CH0433761316)	0.74%	n/a	400	–	–
Genentech Senior Notes					
5.25% Senior Notes due 15 July 2035, principal USD 0.5 billion, outstanding USD 0.325 billion (ISIN: US368710AC32)	5.39%	n/a	320	318	332
Total bonds and notes			**18,041**	**17,986**	**19,644**

Bonds and notes maturity in millions of CHF

	2018	2017	2016
Within one year	1,959	2,167	2,675
Between one and two years	583	1,955	1,674
Between two and three years	2,560	581	2,055
Between three and four years	1,138	2,597	613
Between four and five years	1,560	1,132	2,733
More than five years	10,241	9,554	9,894
Total bonds and notes	**18,041**	**17,986**	**19,644**

Unamortised discount included in carrying value of bonds and notes in millions of CHF

	2018	2017	2016
US dollar notes	83	88	102
Euro notes	10	14	17
Swiss franc bonds	0	0	2
Pound sterling notes	1	1	2
Total unamortised discount	**94**	**103**	**123**

Issuance of bonds and notes – 2018

On 24 September 2018 the Group completed an offering of CHF 0.5 billion and CHF 0.4 billion fixed rate bonds with a coupon of 0.25% and 0.75%, respectively. The bonds will mature on 24 September 2025 and 24 September 2030, respectively. These bonds are listed at the SIX Swiss Exchange. The Group received CHF 901 million aggregate net proceeds from the issuance and sale of these fixed rate bonds.

On 17 September 2018 the Group completed an offering of USD 0.75 billion and USD 0.65 billion fixed rate notes with a coupon of 3.25% and 3.625%, respectively. The notes will mature on 17 September 2023 and 17 September 2028, respectively. The Group received CHF 1,351 million aggregate net proceeds from the issuance and sale of these fixed rate notes.

Issuance of bonds and notes – 2017

On 23 March 2017 the Group completed an offering of CHF 1.5 billion fixed rate bonds issued in three tranches, of which CHF 400 million for bonds with a zero coupon which matured on 23 September 2018, CHF 750 million for bonds with a 0.10% coupon which will mature on 23 September 2024, and CHF 350 million for bonds with a 0.45% coupon which will mature on 23 March 2029. These bonds were listed at the SIX Swiss Exchange. The Group received CHF 1,502 million aggregate net proceeds from the issuance and sale of these fixed rate bonds.

Redemption and repurchase of bonds and notes – 2018

Redemption of euro notes. On the due date of 25 June 2018 the Group redeemed the 2.00% fixed rate notes with a principal amount of EUR 1.0 billion. The cash outflow was CHF 1,152 million, plus accrued interest. The effective interest rate of these bonds was 2.07%.

Redemption of Swiss franc bonds. On the due date of 21 September 2018 the Group redeemed the 1.0% fixed rate bonds with a principal amount of CHF 0.6 billion. The cash outflow was CHF 600 million, plus accrued interest. The effective interest rate of these bonds was 1.04%.

On the due date of 23 September 2018 the Group redeemed the bonds with a zero coupon and a principal amount of CHF 0.4 billion. The cash outflow was CHF 400 million, plus accrued interest. The effective interest rate of these bonds was –0.45%.

Redemption and repurchase of bonds and notes – 2017

Redemption of Swiss franc bonds. On the due date of 23 March 2017 the Group redeemed the 4.5% fixed rate bonds with a principal amount of CHF 1.5 billion. The cash outflow was CHF 1,500 million, plus accrued interest. The effective interest rate of these bonds was 4.77%.

Redemption of US dollar notes. On the due date of 29 September 2017 the Group redeemed the 1.35% fixed rate notes with a principal amount of USD 0.85 billion. The cash outflow was CHF 825 million, plus accrued interest. The effective interest rate of these notes was 1.41%.

On the due date of 29 September 2017 the Group redeemed floating rate notes with a principal amount of USD 0.3 billion. The cash outflow was CHF 291 million, plus accrued interest. The effective interest rate of these notes was 0.77%.

Redemption of pound sterling notes. On 17 November 2017 the Group completed a tender offer to repurchase GBP 123 million of the 5.375% fixed rate notes due 29 August 2023. The cash outflow was CHF 200 million, plus accrued interest and there was a loss on repurchase of CHF 37 million. The effective interest rate of these notes was 5.46%.

Redemption of euro notes. On 17 November 2017 the Group completed a tender offer to repurchase EUR 176 million of the 6.5% fixed rate notes due 4 March 2021. The cash outflow was CHF 252 million, plus accrued interest and there was a loss on repurchase of CHF 47 million. The effective interest rate of these notes was 6.66%.

There was an additional CHF 10 million gain recognised as part of net (gains) losses on redemption and repurchase of bonds and notes coming from a termination of a cross-currency swap used to hedge the tendered portion of the euro notes.

Cash flows from issuance, redemption and repurchase of bonds and notes

Cash inflows from issuance of bonds and notes in millions of CHF

	2018	2017
US dollar notes	1,351	0
Swiss franc bonds	901	1,502
Total cash inflows from issuance of bonds and notes	**2,252**	**1,502**

Cash outflows from redemption and repurchase of bonds and notes in millions of CHF

	2018	2017
Euro Medium Term Note programme – Pound sterling notes	0	(200)
Euro Medium Term Note programme – Euro notes	(1,152)	(252)
US dollar notes	0	(1,116)
Swiss franc bonds	(1,000)	(1,500)
Total cash outflows from redemption and repurchase of bonds and notes	**(2,152)**	**(3,068)**

Commercial paper

Roche Holdings, Inc. commercial paper program. Roche Holdings, Inc. has an established commercial paper program under which it can issue up to USD 7.5 billion of unsecured commercial paper notes guaranteed by Roche Holding Ltd. The total committed credit lines that are available as a back-stop supporting the commercial paper program are USD 7.5 billion at 31 December 2018. The maturity of the notes under the program cannot exceed 365 days from the date of issuance. At 31 December 2018 unsecured commercial paper notes with a principal amount of USD 0.6 billion and an average interest rate of 2.36% were outstanding.

Movements in commercial paper obligations in millions of CHF

	2018	2017
At 1 January	774	2,116
Net cash proceeds (payments)	(199)	(1,258)
Currency translation effects	3	(84)
At 31 December	**578**	**774**

Amounts due to banks and other financial institutions

These amounts are denominated in various currencies and the average interest rate was 6.3% (2017: 6.98%). At 31 December 2018 the amounts outstanding of CHF 144 million (2017: CHF 176 million) are due within one year.

22. Equity attributable to Roche shareholders

Changes in equity attributable to Roche shareholders in millions of CHF

					Reserves	
	Share capital	Retained earnings	Fair value	Hedging	Translation	Total
Year ended 31 December 2017						
At 1 January 2017	160	31,092	185	63	(7,589)	23,911
Net income recognised in income statement	–	8,633	–	–	–	8,633
Available-for-sale investments						
– Fair value gains (losses) taken to equity	–	–	68	–	–	68
– Transferred to income statement	–	–	(105)	–	–	(105)
– Income taxes [5]	–	–	15	–	–	15
– Non-controlling interests	–	–	(4)	–	–	(4)
Cash flow hedges						
– Gains (losses) taken to equity	–	–	–	129	–	129
– Transferred to income statement [a)]	–	–	–	(160)	–	(160)
– Income taxes [5]	–	–	–	20	–	20
– Non-controlling interests	–	–	–	11	–	11
Currency translation of foreign operations						
– Exchange differences	–	–	(1)	(2)	265	262
– Accumulated differences transferred to income statement on divestment of subsidiaries [23]	–	–	–	–	100	100
– Non-controlling interests	–	–	–	–	20	20
Defined benefit plans						
– Remeasurement gains (losses) [26]	–	732	–	–	–	732
– Limit on asset recognition [26]	–	0	–	–	–	0
– Income taxes [5]	–	(328)	–	–	–	(328)
– Non-controlling interests	–	(3)	–	–	–	(3)
Other comprehensive income, net of tax	**–**	**401**	**(27)**	**(2)**	**385**	**757**
Total comprehensive income	**–**	**9,034**	**(27)**	**(2)**	**385**	**9,390**
Dividends	–	(6,998)	–	–	–	(6,998)
Equity compensation plans, net of transactions in own equity	–	146	–	–	–	146
Changes in non-controlling interests	–	(8)	–	–	–	(8)
At 31 December 2017	**160**	**33,266**	**158**	**61**	**(7,204)**	**26,441**

a) The entire amount transferred to the income statement was reported in other financial income (expense).

Changes in equity attributable to Roche shareholders in millions of CHF

	Share capital	Retained earnings	Reserves: Fair value	Reserves: Hedging	Reserves: Translation	Total
Year ended 31 December 2018						
At 1 January 2018	160	33,266	158	61	(7,204)	26,441
Implementation of IFRS 9 'Financial Instruments' [33]	–	105	(110)	–	–	(5)
At 1 January 2018 (revised)	160	33,371	48	61	(7,204)	26,436
Net income recognised in income statement	–	10,500	–	–	–	10,500
Financial assets at fair value through OCI						
– Fair value gains (losses) – equity investments at fair value through OCI	–	–	89	–	–	89
– Fair value gains (losses) taken to retained earnings on disposal of equity investments at fair value through OCI	–	115	(115)	–	–	–
– Fair value gains (losses) – debt securities at fair value through OCI	–	–	(3)	–	–	(3)
– Fair value gains (losses) transferred to income statement – debt securities at fair value through OCI	–	–	(5)	–	–	(5)
– Income taxes [5]	–	(10)	9	–	–	(1)
– Non-controlling interests	–	(5)	4	–	–	(1)
Cash flow hedges						
– Gains (losses) taken to equity	–	–	–	(61)	–	(61)
– Transferred to income statement [a)]	–	–	–	42	–	42
– Income taxes [5]	–	–	–	4	–	4
– Non-controlling interests	–	–	–	1	–	1
Currency translation of foreign operations						
– Exchange differences	–	–	1	–	(295)	(294)
– Accumulated differences transferred to income statement on divestment of subsidiaries [23]	–	–	–	–	4	4
– Non-controlling interests	–	–	–	–	(53)	(53)
Defined benefit plans						
– Remeasurement gains (losses) [26]	–	199	–	–	–	199
– Limit on asset recognition [26]	–	(2)	–	–	–	(2)
– Income taxes [5]	–	(63)	–	–	–	(63)
– Non-controlling interests	–	8	–	–	–	8
Other comprehensive income, net of tax	**–**	**242**	**(20)**	**(14)**	**(344)**	**(136)**
Total comprehensive income	**–**	**10,742**	**(20)**	**(14)**	**(344)**	**10,364**
Dividends	–	(7,094)	–	–	–	(7,094)
Equity compensation plans, net of transactions in own equity	–	51	–	–	–	51
Changes in ownership interest in subsidiaries [6]	–	(2,129)	–	–	–	(2,129)
Changes in non-controlling interests	–	(6)	–	–	–	(6)
At 31 December 2018	**160**	**34,935**	**28**	**47 [b)]**	**(7,548)**	**27,622**

a) The entire amount transferred to the income statement was reported in other financial income (expense).
b) Cost of hedging reserve related to the EUR/USD cross-currency swap is included in the hedging reserve and amounted to CHF 8 million, net of tax, at 31 December 2018.

Equity attributable to Roche shareholders as at 1 January 2018 has been revised following the implementation of IFRS 9 'Financial Instruments' as described in Note 33. In addition, the statement of changes in equity has been adjusted to reflect the presentational changes required by the implementation of this new standard.

Genentech transaction

The Group completed the purchase of the non-controlling interests in Genentech effective 26 March 2009. Based on the International Accounting Standard 27 'Separate Financial Statements' (IAS 27) and consistent with the International Financial Reporting Standard 10 'Consolidated Financial Statements' (IFRS 10), which was adopted by the Group in 2013, this transaction was accounted for in full as an equity transaction. As a consequence, the carrying amount of the consolidated equity of the Group at that time was reduced by CHF 52.2 billion, of which CHF 8.5 billion was allocated to eliminate the book value of Genentech non-controlling interests. This accounting effect significantly impacted the Group's net equity, but has no effect on the Group's business or its dividend policy.

Share capital

At 31 December 2018 the authorised and issued share capital of Roche Holding Ltd, which is the Group's parent company, consisted of 160 million shares with a nominal value of CHF 1.00 each, as in the preceding year. The shares are bearer shares and the Group does not maintain a register of shareholders. Based on information supplied to the Group, a shareholder group with pooled voting rights owns 45.01% (2017: 45.01%) of the issued shares. On 24 March 2011 the shareholder group announced that it would continue the shareholder pooling agreement existing since 1948 with a modified shareholder composition. The shareholder group with pooled voting rights now holds 72,018,000 shares, corresponding to 45.01% of the shares issued. This figure does not include any shares without pooled voting rights that are held outside this group by individual members of the group. Ms Maja Oeri, formerly a member of the pool, now holds 8,091,900 shares representing 5.057% of the voting rights independently of the pool. This is further described in Note 31. Based on information supplied to the Group, Novartis Holding AG, Basel, owns 33.333% (participation below 33⅓%) of the issued shares (2017: 33.333%).

Non-voting equity securities *(Genussscheine)*

At 31 December 2018 702,562,700 non-voting equity securities have been authorised and were in issue as in the preceding year. Under Swiss company law these non-voting equity securities have no nominal value, are not part of the share capital and cannot be issued against a contribution which would be shown as an asset in the balance sheet of Roche Holding Ltd. Each non-voting equity security confers the same rights as any of the shares to participate in the net profit and any remaining proceeds from liquidation following repayment of the nominal value of the shares and, if any, participation certificates. In accordance with the law and the Articles of Incorporation of Roche Holding Ltd, the Company is entitled at all times to exchange all or some of the non-voting equity securities into shares or participation certificates.

Dividends

On 13 March 2018 the shareholders approved the distribution of a dividend of CHF 8.30 per share and non-voting equity security (2017: CHF 8.20) in respect of the 2017 business year. The distribution to holders of outstanding shares and non-voting equity securities totalled CHF 7,094 million (2017: CHF 6,998 million) and has been recorded against retained earnings in 2018. The Board of Directors has proposed dividends for the 2018 business year of CHF 8.70 per share and non-voting equity security which, if approved, would result in a total distribution to shareholders of CHF 7,504 million. This is subject to approval at the Annual General Meeting on 5 March 2019.

Own equity instruments

Holdings of own equity instruments in equivalent number of non-voting equity securities

	2018 (millions)	2017 (millions)
Shares	0	0.1
Non-voting equity securities	8.1	8.6
Total	**8.1**	**8.7**

Own equity instruments are recorded within equity at original purchase cost. At 31 December 2018 the fair value of shares was CHF 1.9 million and the fair value of non-voting equity securities was CHF 2.0 billion. Own equity instruments are held for the Group's potential conversion obligations that may arise from the Group's equity compensation plans (see Note 27).

Reserves

Fair value reserve. At 31 December 2018 the fair value reserve represents the cumulative net change in the fair value of financial assets at fair value through OCI (previously available-for-sale financial assets) until the asset is sold, impaired or otherwise disposed of.

Hedging reserve. The hedging reserve represents the effective portion of the cumulative net change in the fair value of cash flow hedging instruments related to hedged transactions that have not yet occurred.

Translation reserve. The translation reserve represents the cumulative currency translation differences relating to the consolidation of Group companies that use functional currencies other than Swiss francs.

23. Subsidiaries and associates

Chugai

Effective 1 October 2002 the Roche Group and Chugai completed an alliance to create a leading research-driven Japanese pharmaceutical company, which was formed by the merger of Chugai and Roche's Japanese pharmaceuticals subsidiary, Nippon Roche. The merged company is known as Chugai.

Consolidated subsidiary. Chugai is a fully consolidated subsidiary of the Group. This is based on the Group's interest in Chugai at 31 December 2018 of 61.3% (2017: 61.3%) and the Roche relationship with Chugai that is founded on the Basic Alliance, Licensing and Research Collaboration Agreements.

The common stock of Chugai is publicly traded and is listed on the Tokyo Stock Exchange under the stock code 'TSE:4519'. Chugai prepares financial statements in accordance with International Financial Reporting Standards (IFRS) that are filed on a quarterly basis with the Tokyo Stock Exchange. Due to certain consolidation entries there are minor differences between Chugai's stand-alone IFRS results and the results of Chugai as consolidated by the Roche Group in accordance with IFRS.

Chugai summarised financial information in millions of CHF

	2018	2017
Income statement		
Sales [2]	4,675	4,383
Royalties and other operating income [2]	529	310
Total revenues	**5,204**	**4,693**
Operating profit [2]	1,136	856
Balance sheet		
Non-current assets	2,791	2,272
Current assets	5,522	5,182
Non-current liabilities	(275)	(280)
Current liabilities	(1,202)	(1,060)
Total net assets	**6,836**	**6,114**
Cash flows		
Cash flows from operating activities	1,054	945
Cash flows from investing activities	(656)	(322)
Cash flows from financing activities	(310)	(260)

Dividends. The dividends distributed to third parties holding Chugai shares during 2018 totalled CHF 120 million (2017: CHF 102 million) and have been recorded against non-controlling interests (see Note 24). Dividends paid by Chugai to Roche are eliminated on consolidation as intercompany items.

Roche's relationship with Chugai. Chugai has entered into certain agreements with Roche, which are discussed below:

(1) Basic Alliance Agreement – As part of the Basic Alliance Agreement signed in December 2001, Roche and Chugai entered into certain arrangements covering the future operation and governance of Chugai. Amongst other matters these cover the following areas:
- The structuring of the alliance.
- Roche's rights as a shareholder.
- Roche's rights to nominate members of Chugai's Board of Directors.
- Certain limitations to Roche's ability to buy or sell Chugai's common stock.

Chugai issues additional shares of common stock in connection with its convertible debt and equity compensation plans, and may issue additional shares for other purposes, which affects Roche's percentage ownership interest. The Basic Alliance Agreement provides, amongst other matters, that Chugai will guarantee Roche's right to maintain its shareholding percentage in Chugai at not less than 50.1%.

(2) Licensing Agreements – Under the Japan Umbrella Rights Agreement signed in December 2001, Chugai has exclusive rights to market Roche's pharmaceutical products in Japan. Chugai also has the right of first refusal on the development and marketing in Japan of all development compounds advanced by Roche.

The Rest of the World Umbrella Rights Agreement (excluding Japan and South Korea) signed in May 2002 was revised and the Amended and Restated Rest of the World Umbrella Rights Agreement (excluding Japan, South Korea and Taiwan) was signed in August 2014. Under this Agreement Roche has the right of first refusal on the development and marketing of Chugai's development compounds in markets outside Japan, excluding South Korea and Taiwan.

Further to these agreements, Roche and Chugai have signed a series of separate agreements for certain specific products. Depending on the specific circumstances and the terms of the agreement, this may result in payments on an arm's length basis between Roche and Chugai, for any or all of the following matters:
- Upfront payments, if a right of first refusal to license a product is exercised.
- Milestone payments, dependent upon the achievement of agreed performance targets.
- Royalties on future product sales.

These specific product agreements may also cover the manufacture and supply of the respective products to meet the other party's clinical and/or commercial requirements on an arm's length basis.

(3) Research Collaboration Agreements – Roche and Chugai have entered into research collaboration agreements in the areas of small-molecule synthetic drug research and biotechnology-based drug discovery.

Foundation Medicine

On 7 April 2015 the Group acquired a 61.3% controlling interest in Foundation Medicine, Inc. ('FMI'), a publicly owned US company based in Cambridge, Massachusetts, and entered into an Investor Rights Agreement, a Research and Development Collaboration Agreement and several Commercial Collaboration Agreements. FMI has been treated as a fully consolidated subsidiary of the Group since that date. At 31 December 2017 the Group's interest in FMI was 57.5%. The common stock of FMI was publicly traded and was listed on the Nasdaq under the stock code 'FMI'. FMI prepared financial statements in accordance with US GAAP that were filed on a quarterly basis with the SEC. Due to certain consolidation entries there have been differences between FMI's stand-alone US GAAP results and the results of FMI as consolidated by the Roche Group in accordance with IFRS.

On 18 June 2018 the Group entered into a merger agreement with FMI to acquire the outstanding shares of FMI's common stock not already owned by the Group at a price of USD 137.00 per share in cash. A tender offer was launched on 2 July 2018. On 31 July 2018 the transaction closed and FMI became a 100% owned subsidiary of the Group. It has been accounted for in full as an equity transaction (see Note 6).

Dividends. There were no dividends distributed to third parties holding FMI shares during 2018 and 2017.

Associates

Senseonics Holding, Inc. ('Senseonics') has been treated as an associate of the Group and at 31 December 2018 the Group's interest in Senseonics was 16.0% (31 December 2017: 20.7%). The Group is the exclusive distributor for Senseonics' Eversense product solution in major markets outside the US. In the opinion of management this gives the Group the potential to exercise significant influence over the operations of the Senseonics business. The common stock of Senseonics is publicly traded and is listed on the New York Stock Exchange (NYSE-MKT) under the stock code 'SENS'. Senseonics prepares financial statements in accordance with US GAAP that are filed on a quarterly basis with the SEC. The Group accounts for Senseonics using the equity method based on Senseonics' financial statements that are publicly available. The Group's share of Senseonics' results, a profit of CHF 6 million, is included in other financial income (expense) (see Note 4) and the carrying value of the Group's share of Senseonics' net assets at 31 December 2018, an asset of CHF 42 million, is included in other non-current assets (see Note 15).

Divestment of subsidiaries

Divestment of subsidiaries – 2018. On 30 November 2018 the Group sold its wholly owned subsidiary Roche Diagnostics IT Solutions GmbH in Berlin, Germany, to a third party. The total consideration was EUR 2 million, all of which was deferred consideration that will become due on 30 November 2021. A total loss on divestment of CHF 24 million was reported as global restructuring costs in the Diagnostics operating segment and included in general and administration.

During 2018 the Group received deferred consideration of EUR 4 million from the sale of the former subsidiary at the Segrate site, Italy, to a third party.

Divestment of subsidiaries – 2017. On 1 February 2017 the Group sold its wholly owned subsidiary Roche Carolina Inc. in Florence, US, to a third party as part of the previously announced Pharmaceuticals Division's strategic realignment of its manufacturing network. On 1 September 2017 the Group sold its wholly owned subsidiary at the Segrate site, Italy, to a third party as part of the previously announced Pharmaceuticals Division's strategic realignment of its manufacturing network.

The total gains (losses) on these divestments are shown in the table below.

Gains (losses) on divestment of subsidiaries in millions of CHF

	2018	2017
Cash consideration	0	11
Deferred consideration	3	0
Total consideration	**3**	**11**
Property, plant and equipment [8]	0	3
Goodwill [9]	5	0
Cash and cash equivalents	3	0
Provisions [20]	(11)	0
Other net assets (liabilities)	15	9
Currency translation of foreign operations transferred to income statement [22]	4	100
Total net assets disposed	**16**	**112**
Provisions and accruals for residual obligations retained by the Group	(11)	(25)
Gains (losses) on divestment of subsidiaries [7]	**(24)**	**(126)**

Cash flow from divestment of subsidiaries in millions of CHF

	2018			2017		
	Pharmaceuticals	Diagnostics	Total	Pharmaceuticals	Diagnostics	Total
Cash consideration received	0	0	0	11	–	11
Deferred consideration received	4	0	4	0	–	0
Cash in divested company	0	(3)	(3)	0	–	0
Total net cash inflow	**4**	**(3)**	**1**	**11**	**–**	**11**

24. Non-controlling interests

Changes in equity attributable to non-controlling interests in millions of CHF

	2018	2017
At 1 January	2,566	2,491
Net income recognised in income statement		
– Chugai	343	244
– Other non-controlling interests	22	(52)
Total net income recognised in income statement	**365**	**192**
Available-for-sale investments (IAS 39)	n/a	4
Equity investments at fair value through OCI (IFRS 9)	1	n/a
Debt securities at fair value through OCI (IFRS 9)	0	n/a
Cash flow hedges	(1)	(11)
Currency translation of foreign operations	53	(20)
Remeasurements of defined benefit plans	(8)	3
Other comprehensive income, net of tax	**45**	**(24)**
Total comprehensive income	**410**	**168**
Business combinations	0	0
Dividends to non-controlling shareholders		
– Chugai [23]	(120)	(102)
– Other non-controlling interests	(16)	(19)
Equity compensation plans, net of transactions in own equity	10	15
Changes in ownership interest in subsidiaries [6]	(112)	0
Changes in non-controlling interests	6	8
Equity contribution by non-controlling interests	0	5
At 31 December	**2,744**	**2,566**
Chugai	2,585	2,302
Other non-controlling interests	159	264
Total non-controlling interests	**2,744**	**2,566**

25. Employee benefits

Employee remuneration in millions of CHF

	2018	2017
Wages and salaries	11,173	10,629
Social security costs	1,102	1,075
Defined contribution plans [26]	419	482
Operating expenses for defined benefit plans [26]	518	511
Equity compensation plans [27]	508	495
Termination costs [7]	401	378
Other employee benefits	1,175	817
Employee remuneration included in operating results	**15,296**	**14,387**
Net interest cost of defined benefit plans [26]	139	147
Total employee remuneration	**15,435**	**14,534**

Other employee benefits consist mainly of life insurance schemes and certain other insurance schemes providing medical coverage and other long-term and short-term disability benefits.

26. Pensions and other post-employment benefits

The Group's objective is to provide attractive and competitive post-employment benefits to employees, while at the same time ensuring that the various plans are appropriately financed and managing any potential impacts on the Group's long-term financial position. Most employees are covered by pension plans sponsored by Group companies. The nature of such plans varies according to legal regulations, fiscal requirements and market practice in the countries in which the employees are employed. Post-employment benefit plans are classified for IFRS as 'defined contribution plans' if the Group pays fixed contributions into a separate fund or to a third-party financial institution and will have no further legal or constructive obligation to pay further contributions. All other plans are classified as 'defined benefit plans'.

Defined contribution plans

Defined contribution plans are funded through payments by employees and by the Group to funds administered by third parties. The Group's expenses for these plans were CHF 419 million (2017: CHF 482 million). No assets or liabilities are recognised in the Group's balance sheet in respect of such plans, apart from regular prepayments and accruals of the contributions withheld from employees' wages and salaries and of the Group's contributions. The Group's major defined contribution plan is the US Roche 401(k) Savings Plan.

Defined benefit plans

Plans are usually established as trusts independent of the Group and are funded by payments from Group companies and by employees. In some cases, notably for the major defined benefit plans in Germany, the plans are unfunded and the Group pays pensions to retired employees directly from its own financial resources. Plans are usually governed by a senior governing body, such as a Board of Trustees, which is typically composed of both employee and employer representatives. Funding of these plans is determined by local regulations using independent actuarial valuations. Separate independent actuarial valuations are prepared in accordance with the requirements of IAS 19 for use in the Group's financial statements. The Group's major pension plans are located in Switzerland, the US and Germany, which in total account for 84% of the Group's defined benefit obligation (2017: 82%).

Pension plans in Switzerland. Current pension arrangements for employees in Switzerland are made through plans governed by the Swiss Federal Occupational Old Age, Survivors and Disability Pension Act ('BVG'). The Group's pension plans are administered by separate legal foundations, which are funded by regular employee and company contributions. The final benefit is contribution-based with certain minimum guarantees. Due to these minimum guarantees, the Swiss plans are treated as defined benefit plans for the purposes of these IFRS financial statements, although they have many of the characteristics of defined contribution plans. Where there is an under-funding, this may be remedied by various measures such as increasing employee and company contributions, lowering the interest rate on retirement account balances, reducing prospective benefits and a suspension of the early withdrawal facility.

Following a plan change in 2018 the Employee Profit-Sharing Plan ('Mitarbeiter-Gewinnbeteiligung') no longer qualifies as a defined contribution plan but as a defined benefit plan. This resulted in additions to plan assets and defined benefit obligation of approximately CHF 1.1 billion. In 2018 operating income of CHF 43 million was recorded for past service cost from this plan change in Switzerland. Of this amount, CHF 31 million was recorded in the Pharmaceuticals Division, CHF 7 million in the Diagnostics Division and CHF 5 million in Corporate. The past service income was recorded within general and administration.

Pension plans in the US. The Group's major defined benefit plans in the US have been closed to new members since 2007. New employees in the US now join the defined contribution plan. The largest of the remaining defined benefit plans are funded pension plans together with smaller unfunded supplementary retirement plans. The benefits are based on the highest average annual rate of earnings during a specified period and length of employment. The plans are non-contributory for employees, with the Group making periodic payments to the plans. Where there is an under-funding, this would normally be remedied by additional company contributions. In 2018 payments made by the Group were USD 186 million (2017: USD 80 million). The increase in payments compared to 2017 is due to accelerated contributions to benefit from a higher tax deduction. In 2017 the Group entered into an annuity buyout agreement with an insurance company and paid USD 330 million from plan assets to settle the defined benefit obligation for some retired employees. This led to a settlement loss of USD 10 million in 2017.

Pension plans in Germany. The Group's major pension arrangements in Germany are governed by the Occupational Pensions Act ('BetrAVG'). These plans are unfunded and the Group pays pensions to retired employees directly from its own financial resources. These plans are non-contributory for employees. The benefits are based on final salary and length of employment. These plans have been closed to new members since 2007. They have been replaced by a new plan which is funded by regular employee and company contributions and administered through a contractual trust agreement. The final benefit is contribution-based with a minimum guarantee. Due to this minimum guarantee, this plan is treated as a defined benefit plan for the purposes of these IFRS financial statements, although it has many of the characteristics of a defined contribution plan.

Pension plans in the Rest of the World. These represent approximately 11% of the Group's defined benefit obligation (2017: 12%) and consist of a number of smaller plans in various countries. Of these the largest are the pension plans at Chugai, which are independently managed by Chugai, and the main pension plan in the United Kingdom. The Chugai plans are fully described in Chugai's own IFRS financial statements. The UK pension plan is funded by regular employee and company contributions, with benefits based on final salary and length of employment. This plan has been closed to new members since 2003 and has been replaced with a defined contribution plan. In relation to the restructuring of the manufacturing site at Clarecastle, Ireland, the Group entered into an annuity buyout agreement with an insurance company in 2017 and paid EUR 97 million from plan assets to settle the defined benefit obligation for all retired employees. In addition transfer value payments of EUR 14 million from plan assets were made to deferred employees to settle the defined benefit obligation. The Group recorded a settlement loss of EUR 11 million from these transactions in 2017.

Other post-employment benefit ('OPEB') plans. These represent approximately 5% of the Group's defined benefit obligation (2017: 6%) and consist of post-employment healthcare and life insurance schemes, mainly in the US. These plans are mainly unfunded and/or are contributory for employees, with the Group reimbursing retired employees directly from its own financial resources. The Group's major OPEB plans in the US have been closed to new members since 2011. Part of the costs of these plans is reimbursable under the Medicare Prescription Drug, Improvement, and Modernization Act of 2003. There is no statutory funding requirement for these plans. The Group is funding these plans to the extent that it is tax efficient. In 2018 payments made by the Group to these plans were USD 40 million (2017: none). At 31 December 2018 the IFRS funding status was 47% (2017: 43%), including reimbursement rights, for the funded OPEB plans in the US.

Defined benefit plans: income statement in millions of CHF

	2018			2017		
	Pension plans	Other post-employment benefit plans	Total expense	Pension plans	Other post-employment benefit plans	Total expense
Current service cost	567	15	582	516	16	532
Past service (income) cost	(69)	0	(69)	(43)	0	(43)
Settlement (gain) loss	5	0	5	22	0	22
Total operating expenses	**503**	**15**	**518**	**495**	**16**	**511**
Net interest cost of defined benefit plans	107	32	139	113	34	147
Total expense recognised in income statement	**610**	**47**	**657**	**608**	**50**	**658**

Funding status

The funding of the Group's various defined benefit plans is the responsibility of the respective senior governing body, such as a Board of Trustees, and the sponsoring employer, and is managed based on local statutory valuations, which follow the legislation and requirements of the respective jurisdiction in which the plan is established. Qualified independent actuaries carry out statutory actuarial valuations on a regular basis. The actuarial assumptions determining the funding status on the statutory basis are regularly assessed by the local senior governing body. The funding status is closely monitored at a corporate level. The unfunded plans are mainly those in the Group's German affiliates, where the fully reserved pension obligations are used for self-financing of the local affiliate's operations.

In 2018 the IFRS funding status of the funded defined benefit plans improved to 93% (2017: 91%).

Reimbursement rights are linked to the post-employment medical plans in the US and represent the expected reimbursement of the medical expenditure provided under the Medicare Prescription Drug, Improvement, and Modernization Act of 2003.

Defined benefit plans: funding status in millions of CHF

	2018			2017		
	Pension plans	Other post-employment benefit plans	Total	Pension plans	Other post-employment benefit plans	Total
Funded plans						
– Fair value of plan assets	14,962	302	15,264	14,040	316	14,356
– Defined benefit obligation	(15,611)	(889)	(16,500)	(14,652)	(1,053)	(15,705)
Over (under) funding	**(649)**	**(587)**	**(1,236)**	**(612)**	**(737)**	**(1,349)**
Unfunded plans						
– Defined benefit obligation	(4,757)	(263)	(5,020)	(5,109)	(302)	(5,411)
Total funding status	**(5,406)**	**(850)**	**(6,256)**	**(5,721)**	**(1,039)**	**(6,760)**
Limit on asset recognition	(2)	0	(2)	0	0	0
Reimbursement rights	–	118	118	–	140	140
Net recognised asset (liability)	**(5,408)**	**(732)**	**(6,140)**	**(5,721)**	**(899)**	**(6,620)**
Reported in balance sheet						
– Defined benefit plan assets	759	118	877	661	140	801
– Defined benefit plan liabilities	(6,167)	(850)	(7,017)	(6,382)	(1,039)	(7,421)

Plan assets

The responsibility for the investment strategies of funded plans is with the respective senior governance body, such as the Board of Trustees. Asset-liability studies are performed regularly for all major pension plans. These studies examine the obligations from post-employment benefit plans, and evaluate various investment strategies with respect to key financial measures such as expected returns, expected risks, expected contributions, and expected funded status of the plan in an interdependent way. The goal of an asset-liability study is to select an appropriate asset allocation for the funds held within the plan. The investment strategy is developed to optimise expected returns, to manage risks and to contain fluctuations in the statutory funded status. Asset-liability studies include strategies to match the cash flows of the assets with the plan obligations. The Group currently does not use longevity swaps to manage longevity risk.

Plan assets are managed using internal and external asset managers. The actual performance is continually monitored by the pension fund governance bodies as well as being closely monitored at a corporate level. In these financial statements the difference between the interest income and actual return on plan assets is a remeasurement that is recorded directly to other comprehensive income. During 2018 the actual return on plan assets was a loss of CHF 413 million (2017: gain of CHF 1,381 million).

The recognition of plan assets is limited to the present value of any economic benefits available from refunds from the plans or reductions in future contributions to the plans.

Defined benefit plans: fair value of plan assets and reimbursement rights in millions of CHF

	2018			2017		
	Pension plans	Other post-employment benefit plans	Total	Pension plans	Other post-employment benefit plans	Total
At 1 January	14,040	456	14,496	13,257	468	13,725
Additions	1,238	0	1,238	0	0	0
Interest income on plan assets	219	16	235	209	17	226
Remeasurements on plan assets	(611)	(60)	(671)	1,119	32	1,151
Currency translation effects	(48)	11	(37)	(58)	(19)	(77)
Employer contributions	576	37	613	392	0	392
Employee contributions	147	7	154	137	10	147
Benefits paid – funded plans	(590)	(44)	(634)	(562)	(50)	(612)
Benefits paid – settlements	(5)	0	(5)	(449)	0	(449)
Administration costs	(4)	(3)	(7)	(5)	(2)	(7)
At 31 December	**14,962**	**420**	**15,382**	**14,040**	**456**	**14,496**

Defined benefit plans: composition of plan assets in millions of CHF

	2018	2017
Equity securities	4,287	4,921
Debt securities	6,136	5,391
Property	2,120	1,896
Cash and money market instruments	525	216
Other investments	2,196	1,932
At 31 December	**15,264**	**14,356**

Assets are invested in a variety of different classes in order to maintain a balance between risk and return as follows:

- Equity and debt securities which mainly have quoted market prices (Level 1 fair value hierarchy).
- Property which is primarily in private and commercial property funds which mainly have other observable inputs (Level 2 fair value hierarchy).
- Cash and money market instruments which are mainly invested with financial institutions with a credit rating no lower than A.
- Other investments which mainly consist of alternatives, mortgages, commodities and insurance contracts. These are used for risk management purposes and mainly have other observable inputs (Level 2 fair value hierarchy) and unobservable inputs (Level 3 fair value hierarchy).

Included within the fair value of plan assets are the Group's shares and non-voting securities with a fair value of CHF 136 million (2017: CHF 121 million) and debt instruments issued by the Group with a fair value of CHF 5 million (2017: CHF 9 million).

Defined benefit obligation

The defined benefit obligation is calculated using the projected unit credit method. This reflects service rendered by employees to the dates of valuation and incorporates actuarial assumptions primarily regarding discount rates used in determining the present value of benefits, projected rates of remuneration growth and mortality rates. The present value of the defined benefit obligation is determined by discounting the estimated future cash outflows using interest rates of high-quality corporate bonds or government bonds in countries where there is not a deep market in corporate bonds. The corporate or government bonds are denominated in the currency in which the benefits will be paid, and have maturity terms approximating to the terms of the related pension obligation.

The Group's final salary-based defined benefit pension plans in the US, Germany and the United Kingdom have been closed to new participants. Active employees that had been members of these pension plans at the time these were closed to new participants continue to accrue benefits in the final salary-based defined benefit pension plans. New employees in the US and UK now join the Group's defined contribution plans, while new employees in Germany join the contribution-based plan with a minimum guarantee. As a result, the proportion of the defined benefit obligation which relates to these closed plans is expected to decrease in the future. The defined benefit pension plans in Switzerland, where the final benefit is contribution-based with a minimum guarantee, remain open to new employees.

Defined benefit plans: defined benefit obligation in millions of CHF

	2018			2017		
	Pension plans	Other post-employment benefit plans	Total	Pension plans	Other post-employment benefit plans	Total
At 1 January	19,761	1,355	21,116	19,297	1,368	20,665
Additions	1,239	0	1,239	0	0	0
Current service cost	567	15	582	516	16	532
Interest cost	326	48	374	322	51	373
Remeasurements:						
– demographic assumptions	(130)	(42)	(172)	62	(4)	58
– financial assumptions	(766)	(150)	(916)	120	44	164
– experience adjustments	252	(32)	220	213	(16)	197
Currency translation effects	(206)	4	(202)	263	(55)	208
Employee contributions	147	7	154	137	10	147
Benefits paid – funded plans	(590)	(44)	(634)	(562)	(50)	(612)
Benefits paid – unfunded plans	(163)	(9)	(172)	(137)	(9)	(146)
Benefits paid – settlements	(5)	0	(5)	(449)	0	(449)
Past service (income) cost	(69)	0	(69)	(43)	0	(43)
Settlement (gain) loss	5	0	5	22	0	22
At 31 December	**20,368**	**1,152**	**21,520**	**19,761**	**1,355**	**21,116**
Composition of plan						
Active members	10,454	290	10,744	9,545	365	9,910
Deferred vested members	1,593	10	1,603	1,770	15	1,785
Retired members	8,321	852	9,173	8,446	975	9,421
At 31 December	**20,368**	**1,152**	**21,520**	**19,761**	**1,355**	**21,116**
Plans by geography						
Switzerland	9,873	–	9,873	8,554	–	8,554
United States	3,805	1,116	4,921	4,028	1,318	5,346
Germany	4,331	–	4,331	4,661	–	4,661
Rest of the World	2,359	36	2,395	2,518	37	2,555
At 31 December	**20,368**	**1,152**	**21,520**	**19,761**	**1,355**	**21,116**
Duration in years	14.6	12.2	14.5	15.3	12.9	15.2

Actuarial assumptions

The actuarial assumptions used in these financial statements are based on the requirements set out in IAS 19 'Employee Benefits'. They are unbiased and mutually compatible estimates of variables that determine the ultimate cost of providing post-employment benefits. They are set on an annual basis by local management, based on advice from actuaries, and are subject to approval by corporate management and the Group's actuaries. Actuarial assumptions consist of demographic assumptions on matters such as mortality and employee turnover, and financial assumptions on matters such as interest rates, salary and benefit levels, inflation rates and costs of medical benefits. The actuarial assumptions vary based upon local economic and social conditions. The actuarial assumptions used in the various statutory valuations may differ from these based on local legal and regulatory requirements.

Demographic assumptions. The most significant demographic assumptions relate to mortality rates. The Group's actuaries use mortality tables which take into account historic patterns and expected changes, such as further increases in longevity. Rates of employee turnover, disability and early retirement are based on historical behaviour. The average life expectancy assumed now for an individual at the age of 65 is as follows:

Defined benefit plans: average life expectancy at the age of 65 for major schemes in years

		Male		Female	
Country	Mortality table	2018	2017	2018	2017
Switzerland	BVG 2015 projected with CMI model	21.6	21.5	23.6	23.4
United States	RP-2014 projected with MP-2017 [1]	22.2	22.3	23.7	23.9
Germany	Heubeck tables 2018G projected with CMI model [2]	19.4	19.3	22.7	23.3

1) For 2017 RP-2014 tables projected with MP-2014 data were used.
2) For 2017 Heubeck tables 2005G were used.

The mortality assumptions used for the pension plans in Switzerland were based on BVG 2015 applying the Continuous Mortality Investigation ('CMI') model. A long-term rate of 1.25% (2017: 1.25%) was used for longevity improvements.

At 31 December 2018 the Group used as mortality assumptions for the pension plans in Germany Heubeck tables 2018G applying the CMI model with a long-term rate of 1.25% for longevity improvements.

Financial assumptions. These are based on market expectations for the period over which the obligations are to be settled. The assumptions used in the actuarial valuations are shown below.

Defined benefit plans: financial actuarial assumptions

	2018		2017	
	Weighted average	Range	Weighted average	Range
Discount rates	1.98%	0.69%–8.10%	1.80%	0.60%–6.80%
Expected rates of salary increases	2.59%	0.00%–4.50%	2.52%	0.00%–4.50%
Expected rates of pension increases	0.58%	0.00%–3.00%	0.67%	0.00%–3.00%
Expected inflation rates	2.13%	1.75%–3.50%	2.14%	1.50%–3.50%
Immediate medical cost trend rate	6.13%	5.90%–6.30%	6.50%	6.30%–6.50%
Ultimate medical cost trend rate (in 2038)	4.37%	4.00%–4.50%	4.50%	4.50%

Discount rates are determined with reference to interest rates on high-quality corporate bonds or government bonds in countries where there is not a deep market in corporate bonds. Expected rates of salary increases are based on expected inflation rates with an adjustment to reflect the Group's latest expectation of long-term real salary increases. Expected rates of pension increases are generally linked to the expected inflation rate or the funding status of the plan. Expected inflation rates are derived by looking at the level of inflation implied by the financial markets in conjunction with the economists' price inflation forecasts, historic price inflation as well as other economic variables and circumstances. Medical cost trend rates take into account the benefits set out in the plan terms and expected future changes in medical costs. Since the Group's major post-employment medical plans are for US employees, these rates are driven by developments in the US.

Sensitivity analysis. The measurement of the net defined benefit obligation is particularly sensitive to changes in the discount rate, inflation rate, expected mortality and medical cost trend rate assumptions. The following table summarises the impact of a change in those assumptions on the present value of the defined benefit obligation.

Defined benefit plans: sensitivity of defined benefit obligation to actuarial assumptions in millions of CHF

	2018	2017
Increase (decrease) in defined benefit obligation		
Life expectancy		
– 1 year increase	735	635
Discount rates		
– 0.25% increase	(731)	(767)
– 0.25% decrease	777	816
Expected inflation rates		
– 0.25% increase	220	255
– 0.25% decrease	(209)	(242)
Immediate medical cost trend rate		
– 1.00% increase	139	156
– 1.00% decrease	(97)	(129)

Each sensitivity analysis considers the change in one assumption at a time leaving the other assumptions unchanged. This approach shows the isolated effect of changing one individual assumption but does not take into account that some assumptions are related. The method used to carry out the sensitivity analysis is the same as in the prior year.

Cash flows

The Group incurred cash flows from its defined benefit plans as shown in the table below.

Defined benefit plans: cash flows in millions of CHF

	2018	2017
Employer contributions, net of reimbursements – funded plans	(613)	(392)
Benefits paid – unfunded plans	(172)	(146)
Total cash inflow (outflow)	**(785)**	**(538)**

Based on the most recent actuarial valuations, the Group expects that employer contributions for funded plans in 2019 will be approximately CHF 401 million, which includes an estimated CHF 25 million of additional contributions related to the UK defined benefit plans. Benefits paid for unfunded plans in 2019 are estimated to be approximately CHF 182 million, which mostly relate to the German defined benefit plans.

27. Equity compensation plans

The Group operates several equity compensation plans, including separate plans at Chugai and Foundation Medicine. IFRS 2 'Share-based Payment' requires that the fair value of all equity compensation plan awards granted to employees be estimated at grant date and recorded as an expense over the vesting period.

Expenses for equity compensation plans in millions of CHF

	2018	2017
Cost of sales	90	90
Marketing and distribution	114	112
Research and development	185	183
General and administration	119	110
Total operating expenses	**508**	**495**
Equity compensation plans		
Roche Stock-settled Stock Appreciation Rights	175	186
Roche Restricted Stock Unit Plan	281	240
Roche Performance Share Plan	8	11
Roche Connect	24	23
Roche Option Plan	3	3
Bonus Stock Awards	6	6
Chugai and Foundation Medicine plans	11	26
Total operating expenses	**508**	**495**
of which		
– Equity-settled	508	495
– Cash-settled	–	–

Cash inflow (outflow) from equity compensation plans in millions of CHF

	2018	2017
Roche Option Plan exercises	19	36
Chugai and Foundation Medicine plans' exercises	18	14
Roche Connect costs	(24)	(23)
Transactions in own equity	(461)	(385)
Total cash inflow (outflow) from equity-settled equity compensation plans, net of transactions in own equity	**(448)**	**(358)**

The net cash outflow from transactions in own equity mainly arises from sales and purchases of equity instruments which are held for the Group's potential conversion obligations that may arise from the Group's equity compensation plans (see Note 22).

Equity compensation plans

Roche Stock-settled Stock Appreciation Rights. The Group issues Stock-settled Stock Appreciation Rights (S-SARs) to certain directors, management and employees selected at the discretion of the Group. The S-SARs give employees the right to receive non-voting equity securities reflecting the value of any appreciation in the market price of the non-voting equity securities between the grant date and the exercise date. Under the Roche S-SAR Plan 180 million S-SARs will be available for issuance over a ten-year period. The rights, which are non-tradable equity-settled awards, have a seven-year duration and vest on a phased basis over three years.

Roche S-SARs – movement in number of rights outstanding

	2018		2017	
	Number of rights (thousands)	Weighted average exercise price (CHF)	Number of rights (thousands)	Weighted average exercise price (CHF)
Outstanding at 1 January	43,545	235.31	42,178	220.22
Granted	13,068	221.40	11,412	251.42
Forfeited	(3,808)	247.83	(1,848)	252.73
Exercised	(5,565)	170.56	(8,168)	176.27
Expired	(17)	140.29	(29)	151.92
Outstanding at 31 December	**47,223**	**238.12**	**43,545**	**235.31**
– of which exercisable	25,285	241.12	23,524	221.24

Roche S-SARs – terms of rights outstanding at 31 December 2018

			Rights outstanding		Rights exercisable
Year of grant	Number outstanding (thousands)	Weighted average years remaining contractual life	Weighted average exercise price (CHF)	Number exercisable (thousands)	Weighted average exercise price (CHF)
2012	2,349	0.26	158.11	2,349	158.11
2013	3,399	1.26	214.85	3,399	214.85
2014	4,722	2.26	263.47	4,722	263.47
2015	5,939	3.27	256.70	5,939	256.70
2016	8,786	4.27	250.83	5,604	250.82
2017	9,763	5.27	251.42	3,206	251.50
2018	12,265	6.26	221.43	66	220.80
Total	**47,223**	**4.25**	**238.12**	**25,285**	**241.12**

Roche Restricted Stock Unit Plan. The Group issues Restricted Stock Units (RSUs) awards to certain directors, management and employees selected at the discretion of the Group. The RSUs, which are non-tradable, represent the right to receive non-voting equity securities which vest only after a three-year period, subject to performance conditions, if any. There are currently no performance conditions on outstanding RSUs at 31 December 2018. Under the Roche RSU Plan 20 million non-voting equity securities will be available for issuance over a ten-year period. The Roche RSU Plan also includes a value adjustment which will be an amount equivalent to the sum of shareholder distributions made by the Group during the vesting period attributable to the number of non-voting equity securities for which an individual award has been granted.

Roche RSUs – movement in number of awards outstanding

	2018	2017
	Number of awards (thousands)	Number of awards (thousands)
Outstanding at 1 January	2,813	2,343
Granted	1,766	1,373
Forfeited	(331)	(209)
Transferred to participants	(745)	(694)
Outstanding at 31 December	**3,503**	**2,813**
– of which vested and transferable	1	1

Roche Performance Share Plan. The Group offers future share and non-voting equity security awards (or, at the discretion of the Board of Directors, their cash equivalent) to certain directors and key senior managers. These are non-tradable equity-settled awards. The programme currently operates in annual three-year cycles. The Roche Performance Share Plan (PSP) includes a value adjustment which will be an amount equivalent to the sum of shareholder distributions made by the Group during the vesting period attributable to the number of shares or non-voting equity securities for which an individual award has been granted. The amount of shares or non-voting equity securities allocated will depend upon the individual's salary level, the achievement of performance targets linked to the Group's Total Shareholder Return (shares and non-voting equity securities combined) relative to the Group's peers during the three-year period from the date of the grant, and the discretion of the Board of Directors. Each award will result in between zero and two shares or non-voting equity securities (before value adjustment), depending upon the achievement of the performance targets.

Roche Performance Share Plan – terms of outstanding awards at 31 December 2018

	2016–2018	2017–2019	2018–2020
Number of awards outstanding (thousands)	36	41	38
Vesting period	3 years	3 years	3 years
Allocated to recipients in	Feb. 2019	Feb. 2020	Feb. 2021
Fair value per unit at grant (CHF)	264.36	226.66	238.35
Total fair value at grant (CHF millions)	**11**	**11**	**10**

Roche Connect. This programme enables all employees worldwide, except for those in the US and certain other countries, to make regular deductions from their salaries to purchase non-voting equity securities. It is administered by independent third parties. The Group contributes to the programme, which allows the employees to purchase non-voting equity securities at a discount (usually 20%). The administrator purchases the necessary non-voting equity securities directly from the market. At 31 December 2018 the administrator held 3.1 million non-voting equity securities (2017: 2.8 million). In 2018 the cost of the plan was CHF 24 million (2017: CHF 23 million).

Roche Option Plan. This programme is used in countries where S-SARs are not used. Awards under this plan give employees the right to purchase non-voting equity securities at an exercise price specified at the grant date. The options, which are non-tradable equity-settled awards, have a seven-year duration and vest on a phased basis over three years.

Roche Option Plan – movement in number of options outstanding

	2018		2017	
	Number of options (thousands)	Weighted average exercise price (CHF)	Number of options (thousands)	Weighted average exercise price (CHF)
Outstanding at 1 January	754	231.82	834	216.02
Granted	207	221.94	156	250.90
Forfeited	(53)	246.54	(31)	256.52
Exercised	(114)	173.23	(205)	178.25
Expired	0	–	0	–
Outstanding at 31 December	**794**	**236.63**	**754**	**231.82**
– of which exercisable	474	238.66	459	219.10

Roche Option Plan – terms of options outstanding at 31 December 2018

			Options outstanding		Options exercisable
Year of grant	Number outstanding (thousands)	Weighted average years remaining contractual life	Weighted average exercise price (CHF)	Number exercisable (thousands)	Weighted average exercise price (CHF)
2012	51	0.26	157.77	51	157.77
2013	76	1.25	214.00	76	214.00
2014	91	2.25	263.21	91	263.21
2015	123	3.26	256.88	123	256.88
2016	127	4.26	250.44	84	250.44
2017	134	5.28	250.89	47	250.95
2018	192	6.27	222.03	2	220.80
Total	**794**	**3.99**	**236.63**	**474**	**238.66**

The weighted average share price of Roche non-voting equity securities during the year was CHF 232.20 (2017: CHF 247.10).

Bonus Stock Awards. The Chairman of the Board of Directors and the Chief Executive Officer will be granted Bonus Stock Awards in lieu of their cash-settled bonus for the financial year 2018. These are subject to approval by the 2019 Annual General Meeting in March 2019 and will be issued in March 2019. The number of awards and fair value per award will be calculated at the grant date.

Fair value measurement

The inputs used in the measurement of the fair values at grant date of the equity compensation plans were as follows:

Fair value measurement in 2018

	Roche Stock-settled Stock Appreciation Rights	Roche Restricted Stock Unit Plan	Roche Performance Share Plan	Roche Option Plan
Vesting period	Progressively over 3 years	Cliff vesting after 3 years	Cliff vesting after 3 years	Progressively over 3 years
Contractual life	7 years	n/a	n/a	7 years
Number granted during year (thousands)	13,068	1,766	42	207
Weighted average fair value (CHF)	13	222	238	13
Model used	Binomial	Market price[a)]	Monte Carlo[b)]	Binomial
Inputs to option pricing model				
– Share price at grant date (CHF)	221	221	247	221
– Exercise price (CHF)	221	–	–	221
– Expected volatility[c)]	19.1%	n/a	n/a	19.1%
– Expected dividend yield	7.0%	n/a	n/a	7.0%
– Early exercise factor[d)]	1.31	n/a	n/a	1.31
– Expected exit rate	9.7%	n/a	n/a	9.7%

a) The fair value of the Roche RSUs is equivalent to the share price on the date of grant.
b) The input parameters were the covariance matrix between Roche and the other individual companies of the peer group based on a three-year history and a risk-free interest rate of minus 0.800%. The valuation takes into account the defined rank and performance structure which determines the pay-out of the plan.
c) Volatility was determined primarily by reference to historically observed prices of the underlying equity. Risk-free interest rates are derived from zero coupon swap rates at the grant date taken from Datastream.
d) The early exercise factor describes the ratio between the expected market price at the exercise date and the exercise price at which early exercises can be expected, based on historically observed behaviour.

28. Earnings per share and non-voting equity security

Basic earnings per share and non-voting equity security

	2018	2017
Net income attributable to Roche shareholders (CHF millions)	**10,500**	**8,633**
Number of shares (millions) [22]	160	160
Number of non-voting equity securities (millions) [22]	703	703
Weighted average number of own shares and non-voting equity securities held (millions)	(9)	(10)
Weighted average number of shares and non-voting equity securities in issue (millions)	**854**	**853**
Basic earnings per share and non-voting equity security (CHF)	**12.29**	**10.12**

Diluted earnings per share and non-voting equity security

	2018	2017
Net income attributable to Roche shareholders (CHF millions)	10,500	8,633
Increase in non-controlling interests' share of Group net income, assuming all outstanding Chugai stock options exercised (CHF millions)	(1)	(1)
Net income used to calculate diluted earnings per share (CHF millions)	**10,499**	**8,632**
Weighted average number of shares and non-voting equity securities in issue (millions)	854	853
Adjustment for assumed exercise of equity compensation plans, where dilutive (millions)	6	7
Weighted average number of shares and non-voting equity securities in issue used to calculate diluted earnings per share (millions)	**860**	**860**
Diluted earnings per share and non-voting equity security (CHF)	**12.21**	**10.04**

29. Statement of cash flows

Cash flows from operating activities

Cash flows from operating activities arise from the Group's primary activities in the Pharmaceuticals and Diagnostics Divisions. These are calculated using the indirect method by adjusting the Group's operating profit for any operating income and expenses that are not cash flows (for example depreciation, amortisation and impairment) in order to derive the cash generated from operations. This and other operating cash flows are shown in the statement of cash flows. Operating cash flows also include income taxes paid on all activities.

Cash generated from operations in millions of CHF

	2018	2017
Net income	10,865	8,825
Add back non-operating (income) expense		
– Financing costs [4]	770	839
– Other financial (income) expense [4]	(149)	(84)
– Income taxes [5]	3,283	3,423
Operating profit	**14,769**	**13,003**
Depreciation of property, plant and equipment [8]	2,292	2,196
Amortisation of intangible assets [10]	1,294	1,691
Impairment of goodwill [9]	2,254	1,058
Impairment of intangible assets [10]	1,082	2,460
Impairment (reversal) of property, plant and equipment [8]	141	233
Operating (income) expense for defined benefit plans [26]	518	511
Operating expense for equity-settled equity compensation plans [27]	508	495
Net (income) expense for provisions [20]	1,104	270
Bad debt (reversal) expense	47	12
Inventory write-downs	751	663
Net (gain) loss on disposal of products	(335)	(410)
Other adjustments	(1)	74
Cash generated from operations	**24,424**	**22,256**

Cash flows from investing activities

Cash flows from investing activities are principally those arising from the Group's investments in property, plant and equipment and intangible assets, and from the acquisition and divestment of subsidiaries, associates and businesses. Cash flows connected with the Group's portfolio of marketable securities and other investments are also included, as are any interest and dividend payments received in respect of these securities and investments. These cash flows indicate the Group's net reinvestment in its operating assets and the cash flow effects of business combinations and divestments, as well as the cash generated by the Group's other investments.

Interest and dividends received in millions of CHF

	2018	2017
Interest received	23	28
Dividends received	1	2
Total	**24**	**30**

Cash flows from financing activities

Cash flows from financing activities are primarily the proceeds from the issue and repayment of the Group's equity and debt instruments. They also include interest payments and dividend payments on these instruments. Cash flows from short-term financing, including finance leases, are also included. These cash flows indicate the Group's transactions with the providers of its equity and debt financing. Cash flows from short-term borrowings are shown as a net movement, as these consist of a large number of transactions with short maturity.

Dividends paid in millions of CHF

	2018	2017
Dividends to Roche Group shareholders	(7,094)	(6,998)
Dividends to non-controlling shareholders – Chugai	(120)	(102)
Dividends to non-controlling shareholders – Other	(16)	(19)
Dividend withholding tax	(23)	(21)
Total	**(7,253)**	**(7,140)**

Liabilities arising from financing activities

Movements in carrying value of recognised assets (liabilities) in millions of CHF

		Cash flows			Non-cash changes		
	At 1 January	Outflow (Inflow)	Financing costs	Business combinations	Fair value and other	Foreign exchange rates	At 31 December
2018							
Debt [21]	(18,960)	122	(11)	0	2	77	(18,770)
Interest payable [19]	(218)	593	(594)	0	(2)	0	(221)
Derivative financial instruments, net [16, 19, 30]	(22)	21	0	0	(14)	0	(15)
Cash collateral receivables (payables), net [16, 19, 30]	39	(33)	0	0	0	0	6
Total	**(19,161)**	**703**	**(605)**	**0**	**(14)**	**77**	**(19,000)**
2017							
Debt [21]	(22,355)	3,209	(97)	(1)	28	256	(18,960)
Interest payable [19]	(289)	648	(585)	0	3	5	(218)
Derivative financial instruments, net [16, 19, 30]	(262)	17	10	0	213	0	(22)
Cash collateral receivables (payables), net [16, 19, 30]	302	(252)	0	0	1	(12)	39
Total	**(22,604)**	**3,622**	**(672)**	**(1)**	**245**	**249**	**(19,161)**

Significant non-cash transactions

In 2018 there were no significant non-cash transactions (2017: none).

30. Risk management

Group risk management

Risk management is a fundamental element of the Group's business practice on all levels and encompasses different types of risks. At Group level, risk management is an integral part of the long-term forecasting and controlling processes. Material risks are monitored and regularly discussed with the Corporate Executive Committee and the Audit Committee of the Board of Directors.

Financial risk management

The Group is exposed to various financial risks arising from its underlying operations and corporate finance activities. The Group's financial risk exposures are predominantly related to changes in foreign exchange rates, interest rates and equity prices as well as the creditworthiness and the solvency of the Group's counterparties.

Financial risk management within the Group is governed by policies reviewed by the boards of directors of Roche and Chugai as appropriate to their areas of statutory responsibility. These policies cover credit risk, liquidity risk and market risk. The policies provide guidance on risk limits, types of authorised financial instruments and monitoring procedures. As a general principle, the policies prohibit the use of derivative financial instruments for speculative trading purposes. Policy implementation and day-to-day risk management are carried out by the relevant treasury functions and regular reporting on these risks is performed by the relevant accounting and controlling functions within Roche and Chugai.

Credit risk

Credit risk arises from the possibility that counterparties to transactions may default on their obligations, causing financial losses for the Group. The objective of managing counterparty credit risk is to prevent losses of liquid funds deposited with or invested in such counterparties. The maximum exposure to credit risk resulting from financial activities, without considering netting agreements and without taking account of any collateral held or other credit enhancements, is equal to the carrying value of the Group's financial assets.

The Group considers a financial asset to be in default when the counterparty is unlikely to pay its obligations to the Group in full. In assessing whether a counterparty is in default, the Group considers both qualitative and quantitative indicators (e.g. overdue status) that are based on data developed internally and for certain financial assets are also obtained from external sources. A major part of the Group's receivables which are past due more than 90 days relate to public customers. Risk of default of public customers is considered low. The Group has reasonable and supportable information to demonstrate that a more lagging default criterion is more appropriate for this particular customer segment.

Accounts receivable. At 31 December 2018 the Group has trade receivables of CHF 10.7 billion (2017: CHF 10.4 billion). These are subject to a policy of active credit risk management which focuses on the assessment of country risk, credit availability, ongoing credit evaluation and account monitoring procedures. The objective of trade receivables management is to maximise the collection of unpaid amounts.

The Group uses an allowance matrix to estimate the allowance for doubtful accounts for all trade receivables. The expected credit loss ('ECL') rate is based on the Group's historical experience and the Group's expectation of economic conditions over the period until receivables are expected to be paid.

Customer credit risk exposure based on accounts receivable days overdue (IFRS 9) in millions of CHF

	Total	Current	Overdue 1–3 months	Overdue 3–12 months	Overdue more than 1 year	Credit impaired
At 31 December 2018						
Gross carrying amount	10,316	8,374	950	429	510	53
Group's expected credit loss rate	5%	0%	2%	8%	80%	100%
Allowance for doubtful accounts	(540)	(23)	(19)	(36)	(409)	(53)

Ageing of accounts receivable that are not impaired (IAS 39) in millions of CHF

At 31 December 2017	
Neither overdue nor impaired	8,629
Overdue under 1 month	203
Overdue 1–3 months	283
Overdue 3–6 months	251
Overdue 6–12 months	211
Overdue more than 1 year	0
Total accounts receivable	**9,577**

At 31 December 2018 the Group's combined trade receivables balance with three US national wholesale distributors, McKesson Corp., AmerisourceBergen Corp. and Cardinal Health, Inc., was equivalent to CHF 2.7 billion representing 25% of the Group's consolidated trade receivables (2017: CHF 2.4 billion representing 23%). There is no other significant concentration of counterparty credit risk due to the Group's large number of customers and their wide geographical spread. Risk limits and exposures are continuously monitored by country and by the nature of counterparties. The Group obtains credit insurance and similar enhancements when appropriate to protect the collection of trade receivables. At 31 December 2018 no collateral was held for trade receivables (2017: none).

Since 2010 there have been financial difficulties in Southern European countries, notably Spain, Italy, Greece and Portugal. The Group is a leading supplier to the healthcare sectors in these countries and has trade receivables of CHF 0.8 billion (2017: CHF 0.9 billion) with the public and private customers in these countries. The Group uses different measures to improve collections in these countries, including intense communication with customers, factoring, negotiations of payment plans, charging of interest for late payments, and legal actions.

The nature and geographic location of counterparties to accounts receivable that are not overdue or impaired are shown in the table below. These include the balances with US national wholesalers and Southern Europe public customers described above.

Accounts receivable (not overdue), net of allowances for doubtful accounts and other allowances: nature and geographical location of counterparties in millions of CHF

	2018				2017			
Regions	Total	Public	Wholesalers/ distributors	Private	Total	Public	Wholesalers/ distributors	Private
Switzerland	47	19	8	20	36	15	8	13
Europe	1,445	646	355	444	1,629	693	326	610
North America	3,255	74	3,161	20	3,092	56	2,295	741
Latin America	591	144	278	169	586	84	202	300
Japan	1,285	5	1,263	17	1,267	–	1,262	5
Asia, Australia and Oceania	1,129	144	766	219	1,192	60	491	641
Rest of the World	599	10	427	162	827	165	259	403
Total	**8,351**	**1,042**	**6,258**	**1,051**	**8,629**	**1,073**	**4,843**	**2,713**

Cash and marketable securities (excluding equity securities). At 31 December 2018 the Group has cash and marketable securities (excluding equity securities) of CHF 13.1 billion (2017: CHF 12.0 billion). These are subject to a policy of restricting exposures to high-quality counterparties and setting defined limits for individual counterparties. These limits and counterparty credit ratings are reviewed regularly.

Cash and cash equivalents are held with banks and financial institutions, which are predominantly rated as investment grade (97% and 96% in 2018 and 2017, respectively), based on Moody's and Standard & Poor's ratings. Cash and short-term time deposits are subject to rules which limit the Group's exposure to individual financial institutions.

Impairment on cash and cash equivalents is measured on a 12-month expected credit losses ('ECL') basis with a reference to external credit ratings of the counterparties, and reflect the short maturities of the exposures. The Group considers that its cash and cash equivalents have low credit risk based on these external credit ratings.

Investments in marketable securities (excluding equity securities) are entered into on the basis of guidelines with regard to liquidity, quality and maximum amount. As a general rule, the Group invests only in high-quality securities with adequate liquidity and with counterparties that have a credit rating of at least Baa3 from Moody's and BBB- from Standard & Poor's.

The credit risk of the counterparties with external ratings below investment grade or non-rated is closely monitored and reviewed on an individual basis.

Rating analysis of cash and marketable securities (excluding equity securities) – market values in millions of CHF

	2018 (IFRS 9)			2017 (IAS 39)		
	Total	Fair value through OCI (12-month ECL)	Amortised costs (12-month ECL)	Total	Available-for-sale	Loans and receivables
AAA range	1,637	1,439	198	1,924	1,745	179
AA range	1,822	283	1,539	1,845	1,414	431
A range	8,687	2,042	6,645	7,249	3,563	3,686
BBB range	764	481	283	797	546	251
Total investment grade	**12,910**	**4,245**	**8,665**	**11,815**	**7,268**	**4,547**
Below BBB range (below investment grade)	93	0	93	112	0	112
Unrated	106	0	106	60	0	60
Total gross carrying amounts	**13,109**	**4,245**	**8,864**	**11,987**	**7,268**	**4,719**
Loss allowance[1)]	**1**	**0**	**1**	**0**	**0**	**0**

1) The loss allowance related to fair value through OCI does not affect the carrying amount of marketable securities (excluding equity securities) but is booked against corresponding OCI reserve instead.

Debt securities at amortised cost and those at fair value through OCI are investment grade and therefore considered to be low risk, and thus the impairment allowance is determined at 12-month expected credit losses ('ECL') with a reference to external credit ratings of the counterparties. There were no debt securities for which the Group observed a significant increase in the credit risk which would require the application of the lifetime expected credit losses impairment model. There was no material impact resulting from the revised impairment approach under IFRS 9. In addition, there were no material movements in the loss allowance in 2018.

Master netting agreements. The Group enters into derivative transactions and collateral agreements under International Swaps and Derivatives Association (ISDA) master netting agreements with the respective counterparties in order to mitigate counterparty risk. Under such agreements the amounts owed by each counterparty on a single day in respect of all transactions outstanding in the same currency are aggregated into a single net amount that is payable by one party to the other. The ISDA agreements do not meet the criteria for offsetting in the balance sheet as the Group does not have a currently enforceable right to offset recognised amounts, because the right to offset is only enforceable on the occurrence of future events, such as a default or other credit events.

Contract terms. At 31 December 2018 there are no significant financial assets whose terms have been renegotiated (2017: none).

Impairment losses. During 2018 total impairment losses for all financial assets excluding equity investments/securities (IFRS 9) amounted to CHF 1 million. During 2017 total impairment losses for available-for-sale assets (IAS 39) amounted to CHF 17 million.

Liquidity risk

Liquidity risk arises through a surplus of financial obligations over available financial assets due at any point in time. The Group's approach to liquidity risk is to maintain sufficient readily available reserves in order to meet its liquidity requirements at any point in time. Roche and Chugai enjoy strong credit quality and are rated by at least one major credit rating agency. The ratings will permit efficient access to the international capital markets in the event of major financing requirements. At 31 December 2018 the Group has unused committed credit lines with various financial institutions totalling CHF 7.7 billion (2017: CHF 7.6 billion), of which CHF 7.4 billion serve as a back-stop line for the commercial paper program.

The remaining undiscounted cash flow contractual maturities of financial liabilities, including estimated interest payments, are shown in the table below.

Contractual maturities of financial liabilities in millions of CHF

	Carrying value	Total	Less than 1 year	1–2 years	2–5 years	Over 5 years
At 31 December 2018						
Debt [21]						
– Bonds and notes	18,041	22,689	2,469	1,068	6,402	12,750
– Other debt	729	729	726	1	2	0
Contingent consideration [20]	511	564	183	23	262	96
Accounts payable [17]	3,526	3,526	3,526	–	–	–
Derivative financial instruments [19]	153	153	64	11	78	0
Total financial liabilities	**22,960**	**27,661**	**6,968**	**1,103**	**6,744**	**12,846**
At 31 December 2017						
Debt [21]						
– Bonds and notes	17,986	22,743	2,661	2,422	5,461	12,199
– Other debt	974	974	970	1	3	0
Contingent consideration [20]	591	650	185	109	278	78
Accounts payable [17]	3,454	3,454	3,454	–	–	–
Derivative financial instruments [19]	119	119	93	10	15	1
Total financial liabilities	**23,124**	**27,940**	**7,363**	**2,542**	**5,757**	**12,278**

Take-or-pay commitments. The Group has entered into contract manufacturing agreements with various companies to further develop manufacturing capacity and flexibility, mainly in the Pharmaceuticals Division. There are future minimum take-or-pay commitments within some of these agreements with a total potential commitment from the Group of CHF 1.4 billion at 31 December 2018 (2017: CHF 1.9 billion).

Market risk

Market risk arises from changing market prices, mainly foreign exchange rates and interest rates, of the Group's financial assets or financial liabilities which affect the Group's financial result and equity.

Value-at-Risk. The Group uses Value-at-Risk (VaR) to measure the impact of market risk on its financial instruments. VaR indicates the value range within which a given financial instrument will fluctuate with a pre-set probability as a result of movements in market prices. VaR is calculated using a historical simulation approach and for each scenario, all financial instruments are fully valued and the total change in value and earnings is determined. VaR calculations are based on a 95% confidence level and a holding period of 20 trading days over the past ten years. This holding period reflects the time required to change the corresponding risk exposure, should this be deemed appropriate.

Actual future gains and losses associated with our treasury activities may differ materially from the VaR analyses due to the inherent limitations associated with predicting the timing and amount of changes to interest rates, foreign exchange rates and equity investment prices, particularly in periods of high market volatilities. Furthermore, VaR does not include the effect of changes in credit spreads.

Market risk of financial instruments in millions of CHF

	2018	2017
VaR – Interest rate component	312	306
VaR – Foreign exchange component	17	24
VaR – Other price component	32	38
Diversification	(40)	(43)
VaR – Total market risk	**321**	**325**

The interest rate component remained largely stable. The foreign exchange component decreased due to a favourable exposure mix. The other price component arises mainly from movements in equity security prices and decreased due to lower volatility in held assets.

Foreign exchange risk

The Group uses the Swiss franc as its reporting currency and as a result is exposed to movements in foreign currencies, mainly the US dollar, Japanese yen and euro. The Group's foreign exchange risk management strategy is to preserve the economic value of its current and future assets and to minimise the volatility of the Group's financial result. The primary focus of the Group's foreign exchange risk management activities is on hedging transaction exposures arising through foreign currency flows or monetary positions held in foreign currencies. The Group uses forward contracts, foreign exchange options and cross-currency swaps to hedge transaction exposures. Application of these instruments intends to continuously immunise against unfavourable developments of foreign exchange rates.

Interest rate risk

The Group mainly raises debt on a fixed rate basis for bonds and notes. The Group is exposed to movements in interest rates, mainly for its US dollar, Swiss franc and euro floating rate financial instruments and short-term debt. The Group's interest rate risk management strategy is to optimise the net interest result. The Group may use forward contracts, options and interest rate swaps to hedge its interest rate exposures. Depending on the interest rate environment of major currencies, the Group will use these instruments to generate an appropriate mix of fixed and floating rate exposures.

Other price risk

Other price risk arises mainly from movements in the prices of equity securities. The Group manages the price risk through placing limits on individual and total equity investments. These limits are defined both as a percentage of total liquid funds and as an absolute number for individual equity investments.

Capital management

The Group defines the capital that it manages as the Group's total capitalisation, being the sum of debt plus equity, including non-controlling interests. The Group's objectives when managing capital are:

- To safeguard the Group's ability to continue as a going concern, so that it can continue to provide benefits for patients and returns to investors.
- To provide an adequate return to investors based on the level of risk undertaken.
- To have available the necessary financial resources to allow the Group to invest in areas that may deliver future benefits for patients and returns to investors.
- To maintain sufficient financial resources to mitigate against risks and unforeseen events.

The capitalisation is reported to senior management as part of the Group's regular internal management reporting and is shown in the table below.

Capital in millions of CHF

	2018	2017	2016
Capital and reserves attributable to Roche shareholders [22]	27,622	26,441	23,911
Equity attributable to non-controlling interests [24]	2,744	2,566	2,491
Total equity	**30,366**	**29,007**	**26,402**
Total debt [21]	**18,770**	**18,960**	**22,355**
Capitalisation	**49,136**	**47,967**	**48,757**

The Group's net equity was significantly impacted by the 2009 Genentech transaction (see Note 22).

The Group is not subject to regulatory capital adequacy requirements as known in the financial services industry. The Group has a majority shareholding in Chugai (see Note 23). Chugai is a public company and its objectives, policies and processes for managing its own capital are determined by Chugai management.

Financial instrument accounting classifications and fair values

The fair values of financial assets and liabilities, together with the carrying value shown in the consolidated balance sheet are as follows:

Carrying value and fair value of financial instruments – 2018 (IFRS 9) in millions of CHF

	Financial instruments mandatorily at fair value through profit or loss	Financial instruments at fair value through OCI	Fair value – hedging instruments	Financial assets at amortised cost	Other financial liabilities	Total carrying value	Fair value
At 31 December 2018 (IFRS 9)							
Other non-current assets [15]							
– Equity investments	458	102	–	–	–	560	560
– Other financial non-current assets	–	–	–	134	–	134	134
Accounts receivable [12]	–	–	–	9,776	–	9,776	9,776
Marketable securities [13]							
– Equity securities	9	–	–	–	–	9	9
– Debt securities	–	1,047	–	–	–	1,047	1,047
– Money market instruments	–	3,198	–	–	–	3,198	3,198
– Time accounts over three months	–	–	–	2,183	–	2,183	2,183
Cash and cash equivalents [14]	–	–	–	6,681	–	6,681	6,681
Other current assets [16]							
– Derivative financial instruments	–	–	138	–	–	138	138
– Other financial current assets	–	–	–	941	–	941	941
Total financial assets	**467**	**4,347**	**138**	**19,715**	**–**	**24,667**	**24,667**
Debt [21]							
– Bonds and notes	–	–	–	–	(18,041)	(18,041)	(18,721)
– Other debt	–	–	–	–	(729)	(729)	(729)
Contingent consideration [20]	(511)	–	–	–	–	(511)	(511)
Accounts payable [17]	–	–	–	–	(3,526)	(3,526)	(3,526)
Derivative financial instruments [19]	–	–	(153)	–	–	(153)	(153)
Total financial liabilities	**(511)**	**–**	**(153)**	**–**	**(22,296)**	**(22,960)**	**(23,640)**

Carrying value and fair value of financial instruments – 2017 (IAS 39) in millions of CHF

	Available-for-sale	Fair value – hedging instruments	Fair value – designated	Loans and receivables	Other financial liabilities	Total carrying value	Fair value
At 31 December 2017 (IAS 39)							
Other non-current assets [15]							
– Available-for-sale investments	546	–	–	–	–	546	546
– Other financial non-current assets	–	–	–	139	–	139	139
Accounts receivable [12]	–	–	–	9,577	–	9,577	9,577
Marketable securities [13]	7,278	–	–	–	–	7,278	7,278
Cash and cash equivalents [14]	–	–	–	4,719	–	4,719	4,719
Other current assets [16]							
– Derivative financial instruments	–	97	–	–	–	97	97
– Other financial current assets	–	–	–	896	–	896	896
Total financial assets	**7,824**	**97**	**–**	**15,331**	**–**	**23,252**	**23,252**
Debt [21]							
– Bonds and notes	–	–	–	–	(17,986)	(17,986)	(19,166)
– Other debt	–	–	–	–	(974)	(974)	(974)
Contingent consideration [20]	–	–	(591)	–	–	(591)	(591)
Accounts payable [17]	–	–	–	–	(3,454)	(3,454)	(3,454)
Derivative financial instruments [19]	–	(119)	–	–	–	(119)	(119)
Total financial liabilities	**–**	**(119)**	**(591)**	**–**	**(22,414)**	**(23,124)**	**(24,304)**

The fair value of bonds and notes is Level 1 and is calculated based on the observable market prices of the debt instruments or the present value of the future cash flows on the instrument, discounted at a market rate of interest for instruments with similar credit status, cash flows and maturity periods.

Fair value hierarchy

The table below analyses financial instruments carried at fair value, by valuation method. The different levels have been defined as follows:
- Level 1 – quoted prices (unadjusted) in active markets for identical assets and liabilities.
- Level 2 – observable inputs other than quoted prices in active markets for identical assets and liabilities.
- Level 3 – unobservable inputs.

Fair value hierarchy of financial instruments in millions of CHF

	Level 1	Level 2	Level 3	Total
At 31 December 2018 (IFRS 9)				
Marketable securities [13]				
– Equity securities at fair value through profit or loss	9	–	–	9
– Debt securities at fair value through OCI	976	71	–	1,047
– Money market instruments at fair value through OCI	–	3,198	–	3,198
Derivative financial instruments [16]	–	138	–	138
Equity investments at fair value through OCI [15]	–	102	–	102
Equity investments at fair value through profit or loss [15]	248	210	–	458
Financial assets recognised at fair value	**1,233**	**3,719**	**–**	**4,952**
Derivative financial instruments [19]	–	(153)	–	(153)
Contingent consideration [20]	–	–	(511)	(511)
Financial liabilities recognised at fair value	**–**	**(153)**	**(511)**	**(664)**
At 31 December 2017 (IAS 39)				
Marketable securities [13]				
– Equity securities	10	–	–	10
– Debt securities	1,118	43	–	1,161
– Money market instruments and time accounts over three months	50	6,057	–	6,107
Derivative financial instruments [16]	–	97	–	97
Available-for-sale investments – held at fair value [15]	121	173	–	294
Financial assets recognised at fair value	**1,299**	**6,370**	**–**	**7,669**
Derivative financial instruments [19]	–	(119)	–	(119)
Contingent consideration [20]	–	–	(591)	(591)
Financial liabilities recognised at fair value	**–**	**(119)**	**(591)**	**(710)**

The fair value hierarchy has been adjusted to reflect the presentational changes required as a result from implementing IFRS 9 'Financial Instruments' as described in Note 33.

Level 1 financial assets consist of treasury bills, bonds and quoted shares. Level 2 financial assets consist primarily of commercial paper, certificates of deposit and derivative financial instruments.

The Group determines Level 2 fair values using the following valuation techniques:
- Marketable securities and derivative financial instruments are based on valuation models that use observable market data for interest rates, yield curves, foreign exchange rates and implied volatilities for similar instruments at the measurement date.
- Equity investments at fair value through OCI and at fair value through profit or loss (previously available-for-sale investments) are based on a valuation model that uses the most recently published observable market data.

The Group recognises transfers between levels of the fair value hierarchy as of the end of the reporting period during which the transfer has occurred. There were no significant transfers between Level 1 and Level 2 and vice versa during the year (2017: none).

Time accounts over three months are accounted for at amortised cost under IFRS 9 and as a result are no longer included in the fair value hierarchy analysis for 2018 (they were accounted for as available-for-sale under IAS 39 and therefore were included in the fair value hierarchy in 2017).

Level 3 fair values

Details of the determination of Level 3 fair value measurements are set out below.

Contingent consideration arrangements in millions of CHF

	2018	2017
At 1 January	(591)	(1,089)
Arising from business combinations [6]	0	(10)
Utilised for settlements [6]	14	146
Total unrealised gains and losses included in the income statement		
– Unused amounts reversed – recorded within general and administration	130	366
– Additional amount created – recorded within general and administration	(51)	(13)
– Discount unwind included in financing costs	(15)	(14)
Total gains and losses included in other comprehensive income		
– Currency translation effects	2	23
At 31 December	**(511)**	**(591)**

During 2018 contingent consideration provisions decreased mainly due to the reversal of some of the provisions and to the payment of milestones. There was CHF 79 million of income, net, mainly from the reversal of the remaining provision related to the Trophos acquisition in 2015. Payments of CHF 14 million were made during 2018 for milestones related to the Dutalys and other acquisitions.

Contingent consideration arrangements

The Group is party to certain contingent consideration arrangements arising from business combinations. The fair values are determined considering the expected payments, discounted to present value using a risk-adjusted average discount rate of 3.6% (2017: 3.1%). The expected payments are determined by considering the possible scenarios of forecast sales and other performance criteria, the amount to be paid under each scenario, and the probability of each scenario. The significant unobservable inputs are the forecast sales, other performance criteria and the risk-adjusted discount rate. The estimated fair value would increase if the forecast sales or other performance criteria rates were higher or the risk-adjusted discount rate was lower. At 31 December 2018 the total potential payments under contingent consideration arrangements could be up to CHF 1.0 billion (2017: CHF 1.4 billion) as follows:

Potential payments under contingent consideration arrangements in millions of CHF

Acquisition	Year acquired	Operating segment	2018	2017
Dutalys	2014	Roche Pharmaceuticals	246	254
Santaris	2014	Roche Pharmaceuticals	156	148
Trophos	2015	Roche Pharmaceuticals	0	409
GeneWeave	2015	Diagnostics	167	166
Genia	2014	Diagnostics	165	164
Ariosa	2015	Diagnostics	148	147
Others	Various	Diagnostics	127	135
At 31 December			**1,009**	**1,423**

Derivative financial instruments

The Group has entered into various currency swaps for certain non-US dollar debt instruments. Cash collateral agreements were entered into with the counterparties to the currency swaps to mitigate counterparty risk. The following table sets out the carrying value of derivative financial instruments and the amounts that are subject to master netting agreements.

Derivative financial instruments in millions of CHF

	Assets			Liabilities		
	2018	2017	2016	2018	2017	2016
Foreign currency derivatives						
– Forward exchange contracts	131	92	162	(64)	(92)	(219)
– Cross-currency swaps	0	0	0	(67)	(9)	(220)
– Other	0	0	0	0	0	0
Interest rate derivatives						
– Swaps	7	5	23	(22)	(18)	(8)
– Other	0	0	0	0	0	0
Other derivatives	0	0	0	0	0	0
Carrying value of derivative financial instruments [16, 19]	**138**	**97**	**185**	**(153)**	**(119)**	**(447)**
Derivatives subject to master netting agreements	(63)	(70)	(72)	63	70	72
Collateral arrangements	(33)	25	13	39	14	289
Net amount	**42**	**52**	**126**	**(51)**	**(35)**	**(86)**

Collateral arrangements

On 17 November 2017 the Group completed a tender offer to repurchase EUR 176 million of the 6.5% fixed rate notes due 4 March 2021. As a result a hedge was terminated and cash was received by the Group from a counterparty.

Movements in cash collateral other receivable (accrued liability) in millions of CHF

	2018	2017
At 1 January	39	302
Net cash delivered by (to) the Group	(33)	(252)
Fair value and other	0	1
Currency translation effects	0	(12)
At 31 December	**6**	**39**

Hedge accounting

Upon transition to IFRS 9 (see Note 33) the Group elected not to restate comparative information. As a result certain information required by IFRS 9 is provided for 2018 only.

As described above the Group's risk management strategy is to hedge the transaction exposures arising through foreign currency flows or monetary positions held in foreign currencies as well as to generate an appropriate mix of fixed and floating rate exposures. The level of hedging depends on market conditions and business requirements of the Group. The Group designates annually a specific interest rate risk management objective to ensure that a predetermined range of its interest rate risk exposure is at a floating rate.

Hedge effectiveness is determined at the inception of the hedge relationship, and through periodic prospective effectiveness assessments at each reporting date to ensure that an economic relationship exists between the hedged item and hedging instrument. The Group performs a qualitative assessment of the hedge effectiveness using a critical terms match method. As the critical terms of the hedged items and the hedging instruments match, the Group concludes that risks being hedged for the hedged items and the hedging instruments are sufficiently aligned, that there is no inherent mismatch in the hedging relationship and that a 100% hedge ratio applies both for the actual quantities hedged and for the hedge accounting.

Accounting treatment, sources of ineffectiveness and prospective effectiveness assessment method by risk category

	Accounting treatment	Potential sources of ineffectiveness	Prospective effectiveness assessment method
Interest rate and foreign exchange rate fluctuations	Cash flow hedge	Counterparty credit risk	Critical terms match
Foreign exchange rate fluctuations	Cash flow hedge	Lower volume of hedged items/ counterparty credit risk	Critical terms match
Interest rate fluctuations	Fair value hedge	Counterparty credit risk	Critical terms match

The ineffective portion of the hedge accounting is recognised in the income statement and included in other financial income (expense). It is measured using the hypothetical derivative method for cash flow hedges and the cumulative dollar offset method for fair value hedges. At 31 December 2018 none of the above potential sources of ineffectiveness, individually or collectively, resulted in material amounts of actual ineffectiveness being reported for any hedge accounting relationships.

The table below shows fair values and nominal amounts of derivative financial instruments, including a range of the timing of the nominal amount of the hedging instruments, which are designated as hedging instruments in a cash flow hedge and a fair value hedge. At 31 December 2018 the Group has the following cash flow hedges and fair value hedges which are designated in a qualifying hedge relationship:

Fair values and nominal amounts of derivatives used for hedge accounting – at 31 December 2018

	Nominal amount	Fair value asset in million CHF	Fair value liability in million CHF	Maturity range
Cash flow hedges				
Risk hedged: Interest rate and foreign exchange rate fluctuations				
– Cross-currency swaps	EUR 850 million fixed into USD	0	(67)	2021
Risk hedged: Foreign exchange rate fluctuations				
– Forward exchange contracts	JPY 224 billion	13	(12)	2019–2020
Total		**13**	**(79)**	
Fair value hedges				
Risk hedged: Interest rate fluctuations				
– Interest rate swaps	USD 3,305 million	1	(22)	2019–2022
– Interest rate swaps	EUR 100 million	1	0	2021
– Interest rate swaps	CHF 250 million	5	0	2022
Total		**7**	**(22)**	

The fair values of derivative financial instruments used for hedge accounting are included in other current assets (see Note 16) or other current liabilities (see Note 19). The Group's approach to managing market risk, including interest rate risk and foreign currency risk, is discussed in the 'Market risk' section in this Note.

Cash flow hedges. The Group has entered into cross-currency swaps to hedge foreign exchange and interest rate risk on some of the bonds and notes issued by the Group which are denominated in euro. At 31 December 2018 such instruments are recorded as a net fair value liability of CHF 67 million (2017: CHF 9 million). There was no ineffective portion.

Chugai has entered into forward exchange contracts to hedge a part of its foreign translation exposure to Swiss franc and US dollar. At 31 December 2018 such instruments are recorded as fair value assets of CHF 13 million and as fair value liabilities of CHF 12 million (2017: fair value assets of CHF 4 million). There was no ineffective portion.

Carrying amount of items designated as hedged items in a cash flow hedging relationship in millions of CHF

	2018 Assets	2018 Liabilities
Bonds and notes		
Risk hedged by cross-currency swaps: Interest rate and foreign exchange rate fluctuations		
– Bonds and notes	–	956
Inventories		
Risk hedged by forward exchange contracts: Foreign exchange rate fluctuations		
– Inventories	2,001	–

Hedging reserve for continuing hedging relationships in millions of CHF

	Total	Cross-currency swaps	2018 Forward exchange contracts
At 1 January	61	60	1
Gains (losses) taken to equity	(61)	(59)	(2)
Transferred to income statement[a]	42	42	0
Income taxes	4	4	0
Non-controlling interests	1	0	1
Currency translation effects	0	0	0
At 31 December	**47**	**47**	**0**

a) The entire amount transferred to the income statement was reported in other financial income (expense).

In 2018 there are no hedging relationships for which hedge accounting is no longer applied. The changes in the hedging reserve within equity are shown in Note 22.

The expected undiscounted cash flows from qualifying cash flow hedges, including interest payments during the duration of the derivative contract and final settlement on maturity, are shown in the table below.

Expected cash flows of qualifying cash flow hedges in millions of CHF

	2018			2017		
	Total	Less than 1 year	More than 1 year	Total	Less than 1 year	More than 1 year
Cash inflows	3,136	1,581	1,555	3,005	1,488	1,517
Cash outflows	(3,281)	(1,588)	(1,693)	(3,111)	(1,493)	(1,618)
Total cash inflow (outflow)	**(145)**	**(7)**	**(138)**	**(106)**	**(5)**	**(101)**

The undiscounted cash flows in the table above will affect profit or loss as shown below. These include interest payments during the duration of the derivative contract but do not include the final settlement on maturity.

Expected cash flows of qualifying cash flow hedges with impact on profit or loss in millions of CHF

	2018			2017		
	Total	Less than 1 year	More than 1 year	Total	Less than 1 year	More than 1 year
Cash inflows	188	63	125	258	64	194
Cash outflows	(225)	(75)	(150)	(297)	(74)	(223)
Total cash inflow (outflow)	**(37)**	**(12)**	**(25)**	**(39)**	**(10)**	**(29)**

Fair value hedges. The Group has entered into some interest rate swaps to hedge its exposure to changes in the fair value of some of its fixed-term debt instruments in respect of a benchmark interest rate. At 31 December 2018 such instruments are recorded as fair value liabilities of CHF 22 million (2017: CHF 18 million) and fair value assets of CHF 7 million (2017: CHF 5 million). During 2018 fair value adjustments of CHF 2 million were recorded on these interest rate swaps (2017: CHF 28 million). As the fair value hedge had been highly effective since inception, the result of the interest rate swaps was largely offset by changes in the fair value of the hedged debt instruments. The Group's approach to managing market risk, including interest rate risk, is discussed in the 'Market risk' section in this Note.

Carrying amount of items designated as hedged items in a fair value hedging relationship in millions of CHF

	Liabilities	Fair value adjustments cumulative	2018 Fair value adjustments in current year
Bonds and notes			
Risk hedged by interest rate swaps: Interest rate fluctuations			
– Bonds and notes	3,569	(15)	(2)

Net investment hedges. The Group does not have any net investment hedges.

31. Related parties

Controlling shareholders

The share capital of Roche Holding Ltd, which is the Group's parent company, consists of 160,000,000 bearer shares.

At 31 December 2018 and 2017, based on information supplied to the Group, a shareholder group with pooled voting rights owned 72,018,000 shares, which represented 45.01% of the issued shares. This group consisted of Ms Vera Michalski-Hoffmann, Ms Maja Hoffmann, Mr André Hoffmann, Dr Andreas Oeri, Ms Sabine Duschmalé-Oeri, Ms Catherine Oeri, Dr Jörg Duschmalé, Mr Lukas Duschmalé and the charitable foundation Wolf. The shareholder pooling agreement has existed since 1948. The figures above do not include any shares without pooled voting rights that are held outside this group by individual members of the group. Ms Maja Oeri, formerly a member of the pool, now holds 8,091,900 shares representing 5.057% of the voting rights independently of the pool.

Mr André Hoffmann and Dr Andreas Oeri are members of the Board of Directors of Roche Holding Ltd. Mr Hoffmann received remuneration totalling CHF 439,123 (2017: CHF 439,392) and Dr Oeri received remuneration totalling CHF 360,000 (2017: CHF 360,000).

There were no other transactions between the Group and the individual members of the above shareholder group with the exception of Dr Jörg Duschmalé, who worked as a post-doc at Roche until the end of September 2018.

Subsidiaries and associates

A listing of the Group subsidiaries and associates is included in Note 32. This listing excludes Chugai's subsidiaries as well as not material companies, notably companies that are inactive, dormant or in liquidation. Transactions between the parent company and its subsidiaries and between subsidiaries are eliminated on consolidation. There were no significant transactions between the Group and its associates.

Key management personnel

Total remuneration of key management personnel was CHF 51 million (2017: CHF 53 million).

Members of the Board of Directors of Roche Holding Ltd receive an annual remuneration and payment for their time and expenses related to their membership of Board committees. Dr Franz and members of the Corporate Executive Committee (CEC) of Roche Holding Ltd receive remuneration, which consists of an annual salary, bonus and an expense allowance. The Group pays social insurance contributions in respect of the above remuneration and pays contributions to pension and other post-employment benefit plans for the Chairman of the Board of Directors and the members of the CEC. The members of the CEC also participate in certain equity compensation plans as described below. The terms, vesting conditions and fair value of these awards are disclosed in Note 27. New members of the CEC are included in the table below for the full calendar year in which they joined the CEC. Similarly, members of the CEC retiring partway through the year are included for the full calendar year in which they left the CEC.

Remuneration of the members of the Board of Directors and the Corporate Executive Committee in millions of CHF

	2018	2017
Salaries, including cash-settled bonus	22	24
Bonus Stock Awards	6	6
Social security costs	2	2
Pensions and other post-employment benefits	4	4
Equity compensation plans	13	12
Board fees	3	4
Other employee benefits	1	1
Total	**51**	**53**

For the purposes of these remuneration disclosures the values for equity compensation plans, including the Bonus Stock Awards, are calculated based on the fair value used in Note 27. These represent the cost to the Group of such awards at grant date and reflect, amongst other matters, the observed exercise behaviour and exit rate for the whole population that receive the awards and initial simulations of any performance conditions.

The detailed disclosures regarding executive remuneration that are required by Swiss law are included in the Remuneration Report included in the Annual Report on pages 120 to 146. In those disclosures the values for equity compensation plans, including the Bonus Stock Awards, represent the fair value that the employee receives taking into account the preliminary assessment of any completed performance conditions. These fair values are shown in the table below, which reconciles those disclosures required by Swiss law to the above related party disclosures for key management personnel.

Reconciliation to executive remuneration disclosures required by Swiss law in millions of CHF

	2018	2017
Total remuneration of the members of the Board of Directors and Corporate Executive Committee (IFRS basis – see table above)	51	53
Deduct		
– Bonus Stock Awards (IFRS basis)	(6)	(6)
– Equity compensation plans (IFRS basis)	(13)	(12)
Add back		
– Bonus Stock Awards (Swiss legal basis)	4	3
– Equity compensation plans (Swiss legal basis)	15	14
Total remuneration of the members of the Board of Directors and Corporate Executive Committee (Swiss legal basis)	**51**	**52**
Of which (including social security costs)		
– Board of Directors (page 134 of the Annual Report)	10	10
– Corporate Executive Committee (page 142 of the Annual Report)	41	42

Bonus Stock Awards. The Chairman of the Board of Directors and the Chief Executive Officer will be granted Bonus Stock Awards in lieu of their cash-settled bonus for the financial year 2018. These are subject to approval by the 2019 Annual General Meeting in March 2019 and will be issued in March 2019. The number of awards and fair value per award will be calculated at the grant date.

Equity compensation plans. The members of the Corporate Executive Committee received equity compensation as shown in the following tables.

Number of rights, options and awards granted to members of the Corporate Executive Committee

	2018	2017
Roche Stock-settled Stock Appreciation Rights	278,433	248,961
Roche Restricted Stock Unit Plan	0	0
Roche Performance Share Plan	32,535	33,682

Contributions paid for members of the Corporate Executive Committee in millions of CHF

	2018	2017
Roche Connect	0.3	0.3

Transactions with former members of the Board of Directors and Corporate Executive Committee. Pensions totalling CHF 2 million were paid by the Group to former Corporate Executive Committee members (2017: CHF 2 million).

Defined benefit plans

Transactions between the Group and the various defined benefit plans for the employees of the Group are described in Note 26.

32. List of subsidiaries and associates

The following is a listing of the Group subsidiaries and associates. It excludes Chugai's subsidiaries as well as not material companies, notably companies that are inactive, dormant or in liquidation.

Listed companies

Country	Company	City		Share capital (in millions)	Equity interest (in %)
Switzerland	Roche Holding Ltd Stock Exchange: SIX Swiss Exchange Zurich Stock code (Share): RO, Valor: 1203211 Stock code *(Genussschein):* ROG, Valor: 1203204 ISIN Share: CH0012032113 ISIN *Genussschein:* CH0012032048 Market capitalisation: CHF 207,328 million	Basel	CHF	160.0	
Japan	Chugai Pharmaceutical Co., Ltd. Stock Exchange: Tokyo Stock code: TSE:4519 ISIN: JP3519400000 Market capitalisation: JPY 3,491,305 million	Tokyo	JPY	335.2	61.3
United States	Senseonics Holdings, Inc. Stock Exchange: New York Stock Exchange (NYSE-MKT) Stock code: SENS ISIN: US81727U1051 Market capitalisation: USD 458 million	Germantown	USD	0.1	16.0

Non-listed companies

Country	Company	City		Share capital (in millions)	Equity interest (in %)
Algeria	Roche Algérie SPA	Hydra	DZD	1.0	48
Argentina	Productos Roche S.A. Química e Industrial	Tigre	ARS	2,841.6	100
	Roche Diabetes Care Argentina S.A.	Tigre	ARS	87.4	100
Australia	Roche Diabetes Care Australia Pty Limited	Bella Vista	AUD	14.1	100
	Roche Diagnostics Australia Pty. Limited	North Ryde	AUD	5.0	100
	Roche Products Pty. Limited	Dee Why	AUD	65.0	100
Austria	mySugr GmbH	Vienna	EUR	5.7	100
	Roche Austria GmbH	Vienna	EUR	14.5	100
	Roche Diabetes Care Austria GmbH	Vienna	EUR	(–)	100
	Roche Diagnostics GmbH	Vienna	EUR	1.1	100
Bangladesh	Roche Bangladesh Limited	Dhaka	BDT	27.2	100
Belarus	FLLC "Roche Products Limited"	Minsk	USD	1.5	100
Belgium	N.V. Roche S.A.	Brussels	EUR	32.0	100
	Roche Diagnostics Belgium NV	Brussels	EUR	3.8	100
Bermuda	Chemical Manufacturing and Trading Company Limited	Hamilton	USD	(–)	100
	Hoffmann-La Roche Products Limited	Hamilton	USD	(–)	100
	Roche Capital Services Ltd.	Hamilton	RUB	(–)	100
	Roche Catalyst Investments Ltd.	Hamilton	USD	(–)	100
	Roche Financial Investments Ltd.	Hamilton	USD	(–)	100
	Roche Financial Management Ltd.	Hamilton	USD	(–)	100
	Roche Financial Services Ltd.	Hamilton	USD	(–)	100
	Roche International Ltd.	Hamilton	USD	(–)	100
	Roche Intertrade Limited	Hamilton	USD	10.0	100
	Roche Operations Ltd.	Hamilton	USD	(–)	100
	Roche Services Holdings Ltd.	Hamilton	USD	(–)	100
	Sapac Corporation Ltd.	Hamilton	CAD	(–)	100
	Syntex Pharmaceuticals International Limited	Hamilton	USD	(–)	100
Bolivia	Roche Bolivia SRL.	Santa Cruz	BOB	0.1	100
Bosnia and Herzegovina	Roche d.o.o. farmaceutsko drustvo – Roche Ltd. Pharmaceutical Company	Sarajevo	BAM	13.1	100
Brazil	Produtos Roche Químicos e Farmacêuticos S.A.	São Paulo	BRL	41.7	100
	Roche Diabetes Care Brasil Ltda.	São Paulo	BRL	44.4	100
	Roche Diagnostica Brasil Ltda.	São Paulo	BRL	415.9	100
Bulgaria	Roche Bulgaria EOOD	Sofia	BGN	5.1	100
Cameroon	Roche Cameroun SARL	Douala	XAF	60.0	100
Canada	Hoffmann-La Roche Limited	Mississauga	CAD	40.3	100
Chile	Roche Chile Limitada	Santiago de Chile	CLP	70.9	100

Country	Company	City		Share capital (in millions)	Equity interest (in %)
China	Roche (China) Holding Ltd.	Shanghai	USD	37.3	100
	Roche (Shanghai) Pharmaceuticals Consulting Co., Ltd	Shanghai	CNY	30.0	100
	Roche (Shanghai) Pharmaceuticals Trading Co., Ltd.	Shanghai	USD	25.0	100
	Roche Diagnostics (Hong Kong) Limited	Hong Kong	HKD	10.0	100
	Roche Diagnostics (Shanghai) Ltd.	Shanghai	USD	31.0	100
	Roche Diagnostics (Suzhou) Limited	Suzhou	USD	100.0	100
	Roche Hong Kong Limited	Hong Kong	HKD	10.0	100
	Roche R&D Center (China) Ltd.	Shanghai	USD	35.8	100
	Shanghai Roche Pharmaceuticals Limited	Shanghai	USD	278.7	70
Colombia	Productos Roche S.A.	Bogotá	COP	26,923.7	100
Costa Rica	Roche Services Americas, Sociedad de Responsabilidad Limitada	San Jose	CRC	5.8	100
	Roche Servicios S.A.	Heredia	USD	8.1	100
Côte d'Ivoire	Roche Côte d'Ivoire SARL	Abidjan	XOF	50.0	100
Croatia	Roche d.o.o.	Zagreb	HRK	4.8	100
Czech Republic	Roche s.r.o.	Prague	CZK	200.0	100
Denmark	Roche a/s, Medicinalvarer og Kemikalier	Hvidovre	DKK	4.0	100
	Roche Diagnostics a/s	Hvidovre	DKK	1.3	100
	Roche Innovation Center Copenhagen A/S	Hoersholm	DKK	100.1	100
Dominican Republic	Productos Roche Dominicana, S.R.L.	Santo Domingo	DOP	0.6	100
Ecuador	Roche Ecuador S.A.	Quito	USD	28.1	100
Egypt	Roche Egypt for Manufacturing and Trading SAE	Cairo	EGP	1.0	100
	Roche Egypt LLC	Cairo	EGP	0.1	95
	RoDiagnostics Egypt for Trading S.A.E	Giza	EGP	5.0	100
El Salvador	Productos Roche (El Salvador) S.A. de C.V.	Antiguo Cuscatlan	SVC	0.2	100
Estonia	Roche Eesti OÜ	Tallinn	EUR	0.1	100
Finland	Roche Diagnostics Oy	Espoo	EUR	0.2	100
	Roche Oy	Espoo	EUR	(–)	100
France	Institut Roche SAS	Boulogne-Billancourt	EUR	(–)	100
	Roche Diabetes Care France SAS	Meylan	EUR	4.5	100
	Roche Diagnostics France SAS	Meylan	EUR	16.0	100
	Roche SAS	Boulogne-Billancourt	EUR	38.2	100
	Trophos SA	Marseille	EUR	1.9	100
Georgia	Roche Georgia LLC	Tbilisi	GEL	0.5	100
Germany	Ascur Versicherungsvermittlungs GmbH	Grenzach-Wyhlen	EUR	(–)	100
	FMI Germany GmbH	Penzberg	EUR	(–)	100
	Galenus Mannheim Pharma GmbH	Mannheim	EUR	(–)	100
	Roche Beteiligungs GmbH	Grenzach-Wyhlen	EUR	3.6	100
	Roche Deutschland Holding GmbH	Grenzach-Wyhlen	EUR	6.0	100
	Roche Diabetes Care Deutschland GmbH	Mannheim	EUR	(–)	100
	Roche Diabetes Care GmbH	Mannheim	EUR	(–)	100
	Roche Diagnostics Deutschland GmbH	Mannheim	EUR	1.0	100
	Roche Diagnostics GmbH	Mannheim	EUR	94.6	100
	Roche mtm laboratories AG	Mannheim	EUR	1.4	100
	Roche Pharma AG	Grenzach-Wyhlen	EUR	61.4	100
	Roche Privacy GmbH	Grenzach-Wyhlen	EUR	(–)	100
	Roche PVT GmbH	Waiblingen	EUR	(–)	100
	Roche Real Estate Services Mannheim GmbH	Mannheim	EUR	1.8	100
	Roche Registration GmbH	Grenzach-Wyhlen	EUR	(–)	100
	Signature Diagnostics GmbH	Potsdam	EUR	0.1	100
Ghana	Roche Products Ghana Limited	Accra	GHS	1.2	100
Greece	Roche (Hellas) S.A.	Athens	EUR	80.1	100
	Roche Diagnostics (Hellas) S.A.	Athens	EUR	27.8	100
Guatemala	Productos Roche Guatemala (Sociedad Anónima)	Guatemala	GTQ	0.6	100
Honduras	Productos Roche (Honduras), S.A.	Tegucigalpa	HNL	(–)	100
Hungary	Roche (Hungary) Ltd	Budapest	HUF	30.0	100
	Roche Services (Europe) Ltd	Budapest	HUF	3.0	100
India	Roche Diabetes Care India Private Limited	Mumbai	INR	15.2	100
	Roche Diagnostics India Private Limited	Mumbai	INR	149.2	100
	Roche Products (India) Private Limited	Mumbai	INR	14.0	100
	Viewics India Private Limited	Pune	INR	(–)	100
Indonesia	P.T. Roche Indonesia	Jakarta	IDR	1,323.0	98.6
Iran	Roche Pars Co. (Ltd.)	Tehran	IRR	41,610.0	100
Ireland	Roche Ireland Limited	Clarecastle	EUR	2.4	100
	Roche Products (Ireland) Limited	Dublin	EUR	(–)	100
Israel	Medingo Ltd.	Yoqneam Illit	ILS	8.0	100
	Roche Pharmaceuticals (Israel) Ltd.	Hod Hasharon	ILS	(–)	100

Country	Company	City		Share capital (in millions)	Equity interest (in %)
Italy	Roche Diabetes Care Italy S.p.A.	Monza	EUR	40.2	100
	Roche Diagnostics S.p.A.	Monza	EUR	18.1	100
	Roche S.p.A.	Monza	EUR	34.1	100
Japan	Roche DC Japan K. K.	Tokyo	JPY	10.0	100
	Roche Diagnostics K.K.	Tokyo	JPY	2,500.0	100
Jordan	F. Hoffmann-La Roche Ltd / Jordan P.S.C.	Amman	JOD	(–)	100
Kazakhstan	Roche Kazakhstan LLP	Almaty	KZT	150.0	100
Kenya	Roche Kenya Limited	Nairobi	KES	40.0	100
Latvia	Roche Latvija SIA	Riga	EUR	1.7	100
Lebanon	Roche Lebanon S.A.R.L.	Beirut	LBP	1,000.0	100
Lithuania	UAB Roche Lietuva	Vilnius	EUR	0.2	100
Macedonia	Roche Makedonija DOOEL	Skopje	EUR	0.3	100
Malaysia	Roche (Malaysia) Sdn. Bhd.	Kuala Lumpur	MYR	4.0	100
	Roche Diagnostics (Malaysia) Sdn. Bhd.	Petaling Jaya	MYR	0.9	100
	Roche Services (Asia Pacific) Sdn. Bhd.	Kuala Lumpur	MYR	0.5	100
Mauritius	Roche Products (Mauritius) Ltd	Quatre Bornes	MUR	4.0	100
Mexico	Productos Roche, S.A. de C.V.	Mexico City	MXN	82.6	100
	Roche DC México, S.A. de C.V.	Mexico City	MXN	3.9	100
	Roche Servicios de México, S.A. de C.V.	Mexico City	MXN	3.5	100
Morocco	Roche S.A.	Casablanca	MAD	59.5	100
Myanmar	Roche Myanmar Company Limited	Yangon	USD	(–)	100
Netherlands	Roche Diabetes Care Nederland B.V.	Almere	EUR	(–)	100
	Roche Diagnostics Nederland B.V.	Almere	EUR	2.3	100
	Roche Finance Europe B.V.	Woerden	EUR	2.0	100
	Roche Nederland B.V.	Woerden	EUR	10.9	100
	Roche Pharmholding B.V.	Woerden	EUR	467.8	100
New Zealand	Roche Diagnostics NZ Limited	Auckland	NZD	3.0	100
	Roche Products (New Zealand) Limited	Auckland	NZD	13.5	100
Nicaragua	Productos Roche (Nicaragua), S.A.	Managua	NIO	0.9	100
Nigeria	Roche Products Limited	Lagos	NGN	200.0	100
Norway	Roche Diagnostics Norge A/S	Oslo	NOK	5.8	100
	Roche Norge A/S	Oslo	NOK	6.2	100
Pakistan	Roche Pakistan Limited	Karachi	PKR	38.3	100
Panama	Productos Roche (Panama), S.A.	Panama City	PAB	(–)	100
	Productos Roche Interamericana S.A. (PRISA)	Panama City	USD	0.1	100
Peru	Productos Roche Química Farmacéutica S.A.	Lima	PEN	11.1	100
	Roche Farma (Peru) S.A.	Lima	PEN	38.1	100
Philippines	Roche (Philippines) Inc.	Taguig City	PHP	300.0	100
Poland	Roche Diabetes Care Polska sp. z o.o.	Warsaw	PLN	2.0	100
	Roche Diagnostics Polska Sp. z o.o.	Warsaw	PLN	8.0	100
	Roche Polska Sp. z o.o.	Warsaw	PLN	25.0	100
Portugal	Roche Farmacêutica Química, Lda.	Amadora	EUR	1.1	100
	Roche Sistemas de Diagnósticos, Sociedade Unipessoal, Lda.	Amadora	EUR	2.6	100
Puerto Rico	Genentech P.R., Inc.	San Juan	USD	(–)	100
	Roche Products Inc.	Ponce	USD	0.5	100
	Syntex Puerto Rico, Inc.	Ponce	USD	(–)	100
Romania	Roche Romania S.R.L.	Bucharest	RON	472.2	100
Russian Federation	Limited Liability Company Roche Diabetes Care Rus	Moscow	RUB	100.0	100
	Limited Liability Company Roche Diagnostics Rus	Moscow	RUB	250.0	100
	Roche - Moscow Ltd.	Moscow	RUB	2.6	100
Saudi Arabia	Roche Products Saudi Arabia LLC	Jeddah	SAR	30.0	100
Serbia	Roche d.o.o. Beograd	Belgrade	EUR	9.6	100
Singapore	Roche Diabetes Care Asia Pacific Pte. Ltd.	Singapore	SGD	0.6	100
	Roche Diagnostics Asia Pacific Pte. Ltd.	Singapore	SGD	20.4	100
	Roche Singapore Pte. Ltd.	Singapore	SGD	4.0	100
	Roche Singapore Technical Operations, Pte. Ltd.	Singapore	USD	35.0	100
Slovakia	Roche Slovensko, S.R.O.	Bratislava	EUR	0.3	100
Slovenia	Roche farmacevtska družba, d.o.o.	Ljubljana	EUR	0.2	100

Country	Company	City		Share capital (in millions)	Equity interest (in %)
South Africa	Kapa Biosystems (Pty) Ltd	Cape Town	ZAR	(–)	100
	Roche Diabetes Care South Africa Proprietary Limited	Midrand	ZAR	15.0	100
	Roche Diagnostics Proprietary Limited	Midrand	ZAR	(–)	100
	Roche Products (Proprietary) Limited	Illovo	ZAR	60.0	100
South Korea	Roche Diagnostics Korea Co., Ltd.	Seoul	KRW	22,969.0	100
	Roche Korea Company Ltd.	Seoul	KRW	13,375.0	100
Spain	Roche Diabetes Care Spain, S.L.	Sant Cugat del Vallès	EUR	1.0	100
	Roche Diagnostics S.L.	Sant Cugat del Vallès	EUR	17.0	100
	Roche Farma, S.A.	Madrid	EUR	45.0	100
Sweden	Roche AB	Solna	SEK	20.0	100
	Roche Diagnostics Scandinavia AB	Solna	SEK	9.0	100
Switzerland	Biopharm AG	Basel	CHF	0.3	100
	F. Hoffmann-La Roche Ltd	Basel	CHF	150.0	100
	Hoffmann - La Roche Ltd	Basel	CHF	0.5	100
	InterMune International AG	Basel	CHF	10.0	100
	Museum Tinguely AG	Basel	CHF	0.1	100
	Phaor AG	Basel	CHF	0.2	100
	Rabbit-Air Ltd	Bachenbülach	CHF	3.0	100
	Roche Capital Market Ltd	Basel	CHF	1.0	100
	Roche Chemische Unternehmungen AG	Basel	CHF	1.3	100
	Roche Diabetes Care (Switzerland) Ltd	Rotkreuz	CHF	0.1	100
	Roche Diagnostics (Switzerland) Ltd	Rotkreuz	CHF	1.0	100
	Roche Diagnostics International Ltd	Rotkreuz	CHF	20.0	100
	Roche Finance Ltd	Basel	CHF	409.2	100
	Roche Forum Buonas Ltd	Buonas	CHF	0.1	100
	Roche Glycart Ltd	Schlieren	CHF	0.3	100
	Roche Long Term Foundation	Basel	CHF	0.5	100
	Roche Pharma (Switzerland) Ltd	Reinach	CHF	2.0	100
	Syntex Pharm AG	Rotkreuz	CHF	0.5	100
	Tavero AG	Basel	CHF	0.1	100
Taiwan	Roche Diagnostics Ltd.	Taipei	TWD	339.5	100
	Roche Products Ltd.	Taipei	TWD	1,000.0	100
Thailand	Roche Diagnostics (Thailand) Limited	Bangkok	THB	103.0	100
	Roche Thailand Limited	Bangkok	THB	12.0	100
Tunisia	Roche Tunisie SA	Tunis	TND	0.8	100
Turkey	Infogenetik Moleküler Bilgi Hizmetleri Anonim Şirketi	Istanbul	TRY	3.5	100
	Roche Diagnostics Turkey Anonim Şirketi	Istanbul	TRY	80.0	100
	Roche Müstahzarlari Sanayi Anonim Şirketi	Istanbul	TRY	249.5	100
Ukraine	Roche Ukraine LLC	Kiev	UAH	124.0	100
United Arab Emirates	Roche Diabetes Care Middle East FZCO	Dubai	AED	0.5	100
	Roche Diagnostics Middle East FZCO	Dubai	AED	19.0	100
	Roche Pharmaceuticals Middle East FZCO	Dubai	AED	0.5	100
United Kingdom	InterMune Holdings Limited	Welwyn Garden City	GBP	(–)	100
	Roche Diabetes Care Limited	Burgess Hill	GBP	0.4	100
	Roche Diagnostics Limited	Burgess Hill	GBP	32.6	100
	Roche Holding (UK) Limited	Welwyn Garden City	GBP	100.0	100
	Roche Products Limited	Welwyn Garden City	GBP	98.3	100
	Roche Registration Limited	Welwyn Garden City	GBP	(–)	100
	Tusk Therapeutics Limited	Welwyn Garden City	GBP	(–)	100

Country	Company	City		Share capital (in millions)	Equity interest (in %)
United States	Adheron Therapeutics Inc.	South San Francisco	USD	(–)	100
	Anadys Pharmaceuticals, Inc.	South San Francisco	USD	(–)	100
	Ariosa Diagnostics, Inc.	San Jose	USD	(–)	100
	Bina Technologies, Inc.	Belmont	USD	(–)	100
	BioVeris Corporation	Indianapolis	USD	(–)	100
	Flatiron Health, Inc.	New York	USD	(–)	100
	ForSight VISION4, Inc.	South San Francisco	USD	(–)	100
	Foundation Medicine Securities Corporation	Cambridge	USD	(–)	100
	Foundation Medicine, Inc.	Cambridge	USD	(–)	100
	Genentech USA, Inc.	South San Francisco	USD	(–)	100
	Genentech, Inc.	South San Francisco	USD	(–)	100
	GeneWEAVE Biosciences, Inc.	Los Gatos	USD	(–)	100
	Hoffmann-La Roche Inc.	Little Falls	USD	3.0	100
	I5 Surviving Corp.	South San Francisco	USD	(–)	100
	IGEN International, Inc.	Pleasanton	USD	(–)	100
	IGEN LS LLC	Pleasanton	USD	(–)	100
	Ignyta, Inc.	San Diego	USD	(–)	100
	InterMune, Inc.	South San Francisco	USD	(–)	100
	IQuum, Inc.	Marlborough	USD	(–)	100
	Jecure Therapeutics, Inc.	San Diego	USD	(–)	100
	Kapa Biosystems, Inc.	Wilmington	USD	(–)	100
	Memory Pharmaceuticals Corp.	Little Falls	USD	(–)	100
	mySugr Inc.	Encinitas	USD	(–)	100
	Roche Diabetes Care, Inc.	Indianapolis	USD	(–)	100
	Roche Diagnostics Corporation	Indianapolis	USD	(–)	100
	Roche Diagnostics Hematology, Inc.	Westborough	USD	(–)	100
	Roche Diagnostics Operations, Inc.	Indianapolis	USD	(–)	100
	Roche Health Solutions Inc.	Indianapolis	USD	(–)	100
	Roche Holdings, Inc.	South San Francisco	USD	1.0	100
	Roche Laboratories Inc.	Little Falls	USD	(–)	100
	Roche Molecular Systems, Inc.	Pleasanton	USD	(–)	100
	Roche Palo Alto LLC	South San Francisco	USD	(–)	100
	Roche Sequencing Solutions, Inc.	Pleasanton	USD	(–)	100
	Roche TCRC, Inc.	New York	USD	(–)	100
	Seragon Pharmaceuticals Inc.	South San Francisco	USD	(–)	100
	Spring Bioscience Corp.	Pleasanton	USD	(–)	100
	Tanox, Inc.	South San Francisco	USD	(–)	100
	Tensha Therapeutics, Inc.	South San Francisco	USD	(–)	100
	Therapeutic Human Polyclonals, Inc.	South San Francisco	USD	(–)	100
	Ventana Medical Systems, Inc.	Tucson	USD	(–)	100
	Viewics, Inc.	San Jose	USD	(–)	100
Uruguay	Roche International Ltd. (Montevideo Branch)	Montevideo	UYU	(–)	100
Venezuela	Productos Roche S.A.	Caracas	VEF	156.9	100
Vietnam	Roche Vietnam Company Limited	Ho Chi Minh City	USD	15.0	100

(–) = share capital of less than 100,000 local currency units.

33. Significant accounting policies

Consolidation policy

Subsidiaries are all companies over which the Group has control. The Group controls an entity when the Group is exposed to, or has rights to, variable returns from its involvement with the entity and has the ability to affect those returns through its power over the entity. Companies acquired during the year are consolidated from the date on which control is transferred to the Group, and subsidiaries to be divested are included up to the date on which control passes from the Group. Intercompany balances, transactions and resulting unrealised income are eliminated in full. Changes in ownership interests in subsidiaries are accounted for as equity transactions if they occur after control has already been obtained and if they do not result in a loss of control. Associates are companies over which the Group exercises, or has the power to exercise, significant influence, but which it does not control and they are accounted for using the equity method.

Segment reporting

For the purpose of segment reporting the Group's Corporate Executive Committee (CEC) is considered to be the Group's Chief Operating Decision Maker. The determination of the Group's operating segments is based on the organisation units for which information is reported to the CEC on a regular basis. The information provided is used as the basis of the segment revenue and profit disclosures reported in Note 2, with the geographic analysis based on the location of customers. Selected segment balance sheet information is also routinely provided to the CEC.

Transfer prices between operating segments are set on an arm's length basis. Operating assets and liabilities consist of property, plant and equipment, goodwill and intangible assets, trade receivables/payables, inventories and other assets and liabilities, such as provisions, which can be reasonably attributed to the reported operating segments. Non-operating assets and liabilities mainly include current and deferred income tax balances, post-employment benefit assets/liabilities and financial assets/liabilities such as cash, marketable securities, investments and debt.

Foreign currency translation

The Annual Financial Statements are presented in Swiss francs. Most Group companies use their local currency as their functional currency. Certain Group companies use other currencies (such as US dollar, Swiss franc or euro) as their functional currency where this is the currency of the primary economic environment in which the entity operates. Local transactions in other currencies are initially reported using the exchange rate at the date of the transaction. Gains and losses from the settlement of such transactions and gains and losses on translation of monetary assets and liabilities denominated in other currencies are included in income, except when they are qualifying cash flow hedges or arise on monetary items that, in substance, form part of the Group's net investment in a foreign entity. In such cases the gains and losses are deferred into other comprehensive income.

Upon consolidation, assets and liabilities of Group companies using functional currencies other than Swiss francs are translated into Swiss francs using year-end rates of exchange. The income statement and statement of cash flows are translated at the average rates of exchange for the year. Translation differences due to the changes in exchange rates between the beginning and the end of the year and the difference between net income translated at the average and year-end exchange rates are taken directly to other comprehensive income.

Revenue

Sales. Revenue from the sale of goods supplied (product sales) and services rendered are recoded as 'Sales'.

Sales are recognised when a promise in a customer contract (performance obligation) has been satisfied by transferring control over the promised goods and services to the customer. Control over a promised good or service refers to the ability to direct the use of, and obtain substantially all of the remaining benefits from, those goods or services. Control is usually transferred upon shipment, delivery to, upon receipt of goods by the customer, or as services are rendered, in accordance with the delivery and acceptance terms agreed with the customers. For goods subject to installation, such as instruments sold in the Diagnostics Division, sales are generally recognised upon completion of the installation at the customer's site and customer acceptance. The amount of sales to be recognised (transaction price) is based on the consideration the Group expects to receive in exchange for its goods and services, excluding amounts collected on behalf of third parties such as value added taxes or other taxes directly linked to sales. If a contract contains more than one performance obligation, the transaction price is allocated to each performance obligation based on their relative stand-alone selling prices.

Instruments in the Diagnostics Division may be sold together with other goods such as reagents and other consumables as well as services under a single contract or under several contracts that are combined for revenue recognition purposes. Sales are recognised upon satisfaction of each of the performance obligations in the contract. Instruments are either sold in cash and instalment sales transactions or otherwise made available to customers under finance lease and operating lease transactions.

- Finance leases: Arrangements in which the Group transfers substantially all of the risks and rewards of ownership to the customer are treated as finance lease arrangements. Sales from finance leases are recognised at amounts that represent the fair value of the instrument, which approximates the present value of the minimum lease payments under the arrangement. As interest rates embedded in finance lease arrangements are approximately market rates, sales from finance leases are comparable to revenue for outright sales. Finance income for finance lease arrangements longer than twelve months is deferred and subsequently recognised based on a pattern that approximates the use of the effective interest rate method and recorded in royalty and other operating income.
- Operating leases: Sales from operating leases are recognised on a straight-line basis over the lease term or, when lease revenue is entirely variable and subject to subsequent reagent sales, as the performance obligation to deliver reagents is satisfied.

Sales, net of discounts, are based on estimates regarding the related obligations, including their stand-alone selling prices or fair values. It requires judgement to determine when different obligations are satisfied, including whether enforceable purchase commitments for further obligations exist and when they arise.

For contracts with distributors, no sales are recognised when goods are physically transferred to the distributor under a consignment arrangement, or if the distributor acts as an agent. In such cases, sales are recognised when control over the goods transfers to the end-customer, and distributor's commissions are presented within marketing and distribution. Commissions and similar payments to distributors acting as principals are deducted from sales unless such payments are in exchange for a distinct service.

The consideration received by the Group in exchange for its goods and services may be fixed or variable. Variable consideration is only recognised when it is considered highly probable that a significant revenue reversal will not occur once the underlying uncertainty related to variable consideration is subsequently resolved. The most common elements of variable consideration in the Pharmaceuticals Division are listed below:

- Government and regulatory mandatory price reductions. These consist of mandatory price reductions. The major elements are 340B Drug Discount Program, Medicaid and other plans in the US.
- Contractual price reductions. These include rebates and chargebacks that are the result of contractual agreements that are primarily volume-based and performance-based.
- Cash discounts. These include credits offered to wholesalers for remitting payment on their purchases within contractually defined incentive periods.
- Customer returns reserves. These are allowances established for expected product returns.

Revenues from product sales are recorded net of allowances for estimated rebates, chargebacks, cash discounts and estimates of product returns, all of which are established at the time of sale. All product sales allowances are based on estimates of the amounts earned or to be claimed on the related sales. These estimates take into consideration historical experience, current contractual and statutory requirements, specific known market events and trends such as competitive pricing and new product introductions, estimated inventory levels, and the shelf life of products. If actual future results vary, these estimates need to be adjusted, with an effect on sales and earnings in the period of the adjustment. Sales reductions that are expected to be withheld by the customer upon settlement, such as contractual price reductions and cash discounts, are recorded in the balance sheet as a deduction from trade receivables. Sales reductions that are separately payable to customers, governmental health authorities or healthcare regulatory authorities are recorded in the balance sheet as accrued liabilities. Provisions for sales returns are recorded in the balance sheet as other provisions.

The Group recognises a deferred income (contract liability) if consideration has been received (or has become receivable) before the Group transfers the promised goods or services to the customer. Deferred income mainly relates to remaining performance obligations for goods free of charge under certain patient access or similar programmes, reagents and other consumables and services.

Remaining performance obligations in (partially) unsatisfied long-term contracts are either included in deferred income or are related to amounts the Group expects to receive for goods and services that have not yet been transferred to customers under existing, non-cancellable or otherwise enforceable contracts. These are mainly associated with contracts with minimum purchase commitments related to reagents and consumables for previously sold instruments as well as monitoring and maintenance services. For contracts that have an original duration of one year or less, the Group has elected the practical expedient to not disclose the transaction price for remaining performance obligations at the end of each reporting period and at which point in time the Group expects to recognise these sales.

Royalty and other operating income. Royalty and other operating income includes royalty income, income from out-licensing agreements and income from disposal of products and other items.

Royalty income earned through a licence is recognised as the underlying sales are recorded by the licensee.

Income from out-licensing agreements typically arises from the receipt of upfront, milestone and other similar payments from third parties for granting a licence to product- or technology-related intellectual property (IP). Out-licensing agreements may be entered into with no further obligation or may include commitments to conduct research, late-stage development, regulatory approval, co-marketing or manufacturing. Licences granted are usually rights to use IP and are generally unique. Therefore the basis of allocating revenue to performance obligations makes use of the residual approach. Upfront payments and other licensing fees are usually recognised upon granting the licence unless some of the income shall be deferred for other performance obligations using the residual approach. Such deferred income is released and recognised as revenue when other performance obligations are satisfied. Milestone payments are typically received upon reaching a specific scientific milestone (development milestone) or upon achieving a certain annual sales milestone (commercial milestone). Development milestone income is recognised at the point in time when it is highly probable that the respective milestone event criteria is achieved, and the risk of revenue reversal is considered remote. Commercial milestone income is accrued and recognised as revenue when it is highly probable that the annual sales milestone is reached during the period.

Payments received for the disposal of product and similar rights are recognised as revenue upon transfer of control over such rights. To the extent that some of these payments relate to other performance obligations, a portion is deferred using the residual approach and recognised as revenue when or as activities such as manufacturing or other services are rendered. Income from profit-sharing arrangements with collaboration partners is recognised as underlying sales and cost of sales are recorded by the collaboration partners. Also included is income from other services rendered which are usually not part of the Group's primary business activities, to the extent that such revenue is not recorded under 'Sales', and is recognised when control transfers and performance obligations are satisfied.

Cost of sales

Cost of sales includes the corresponding direct production costs and related production overheads of goods sold and services rendered. Royalties, alliance and collaboration expenses, including all collaboration profit-sharing arrangements are also reported as part of cost of sales. Start-up costs between validation and the achievement of normal production capacity are expensed as incurred.

Research and development

Internal research and development activities are expensed as incurred for the following:

- Internal research costs incurred for the purpose of gaining new scientific or technical knowledge and understanding.
- Internal development costs incurred for the application of research findings or other knowledge to plan and develop new products for commercial production. The development projects undertaken by the Group are subject to technical, regulatory and other uncertainties, such that, in the opinion of management, the criteria for capitalisation as intangible assets are not met prior to obtaining marketing approval by the regulatory authorities in major markets.
- Post-marketing studies after regulatory approval, such as phase IV costs in the pharmaceuticals business, generally involve safety surveillance and ongoing technical support of a drug after it receives marketing approval to be sold. They may be required by regulatory authorities or may be undertaken for safety or commercial reasons. The costs of such post-marketing studies are not capitalised as intangible assets as, in the opinion of management, they do not generate separately identifiable incremental future economic benefits that can be reliably measured.

Acquired in-process research and development resources obtained through in-licensing arrangements, business combinations or separate asset purchases are capitalised as intangible assets. The acquired asset must be controlled by the Group, be separately identifiable and expected to generate future economic benefits, even if uncertainty exists as to whether the research and development will ultimately result in a marketable product. Consequently, upfront and milestone payments to third parties for pharmaceutical products or compounds before regulatory marketing approval are recognised as intangible assets. Assets acquired through such arrangements are measured on the basis set out in the 'Intangible assets' policy. Subsequent internal research and development costs incurred post-acquisition are treated in the same way as other internal research and development costs. If research and development are embedded in contracts for strategic alliances, the Group carefully assesses whether upfront or milestone payments constitute funding of research and development work or acquisition of an asset.

Employee benefits

Short-term employee benefits include wages, salaries, social security contributions, paid annual leave and sick leave, profit sharing and bonuses, and non-monetary benefits for current employees. The costs are recognised within the operating results when the employee has rendered the associated service. The Group recognises a liability for profit sharing and bonuses where contractually obliged or where there is a past practice that has created a constructive obligation.

Long-term employee benefits include long-service or sabbatical leave, long-service benefits and long-term disability benefits. The expected costs of these benefits are accrued over the period of employment. Any changes in the carrying value of other long-term employee benefit liabilities are recognised within the operating results.

Termination benefits are payable when employment is terminated by the Group before the normal retirement date, or whenever an employee accepts voluntary redundancy in exchange for these benefits. Termination costs are recognised at the earlier of when the Group can no longer withdraw the offer of the benefits or when the Group recognises any related restructuring costs.

Pensions and other post-employment benefits

For defined contribution plans the Group contributions are recognised within the operating results when the employee has rendered the associated service. Prepaid contributions are recognised as an asset to the extent that a cash refund or a reduction in future payments is available.

For defined benefit plans the liability recognised in the balance sheet is the present value of the defined benefit obligation less the fair value of the plan assets. All changes in the net defined benefit liability are recognised as they occur as follows:

Recognised in the income statement:
- Current service cost is charged to the appropriate income statement heading within the operating results.
- Past service cost, including curtailment gains or losses, is recognised immediately in general and administration within the operating results.
- Settlement gains or losses are recognised in general and administration within the operating results.
- Net interest on the net defined benefit liability is recognised in financing costs.

Recognised in other comprehensive income:
- Actuarial gains and losses arising from experience adjustments (the difference between previous assumptions and what has actually occurred) and changes in actuarial assumptions.
- The return on plan assets, excluding amounts included in net interest on the net defined benefit liability.
- Any change in the limit on the recognition of plan assets, excluding amounts included in net interest on the net defined benefit liability.

Net interest on the net defined benefit liability is comprised of interest income on plan assets, interest cost on the defined benefit obligation and interest on the effect of the limit on the recognition of pension assets. The net interest is calculated using the same discount rate that is used in calculating the defined benefit obligation, applied to the net defined liability at the start of the period, taking into account any changes from contribution or benefit payments.

Pension assets and liabilities in different defined benefit plans are not offset unless the Group has a legally enforceable right to use the surplus in one plan to settle obligations in the other plan.

Equity compensation plans

The fair value of all equity compensation awards granted to employees is estimated at the grant date and recorded as an expense over the vesting period. The expense is charged to the appropriate income statement heading within the operating results. For equity-settled plans, an increase in equity is recorded for this expense and any subsequent cash flows from exercises of vested awards are recorded as changes in equity.

Property, plant and equipment

Property, plant and equipment are initially recorded at cost of purchase or construction, and include all costs directly attributable to bringing the asset to the location and condition necessary for it to be capable of operating in the manner intended by management. These include items such as costs of site preparation, installation and assembly costs, and professional fees. The net costs of testing whether the asset is functioning properly, including validation costs, are also included in the initially recorded cost of construction. Interest and other borrowing costs incurred with respect to qualifying assets are capitalised and included in the carrying value of the assets. Property, plant and equipment are depreciated on a straight-line basis, except for land, which is not depreciated. The estimated useful lives of major classes of depreciable assets are as follows:

Land improvements	40 years
Buildings	10–50 years
Machinery and equipment	4–15 years
Diagnostic instruments	3–5 years
Office equipment	3–6 years
Motor vehicles	5–8 years

Where parts of an item of property, plant and equipment have different useful lives, they are accounted for as separate components. The estimated useful lives of the assets are regularly reviewed and, if necessary, the future depreciation charges are accelerated. Repairs and maintenance costs are expensed as incurred.

Leases

Where the Group is the lessee. Finance leases exist when substantially all of the risks and rewards of ownership are transferred to the Group. Finance leases are capitalised at the start of the lease at fair value, or the present value of the minimum lease payments, if lower. The rental obligation, net of finance charges, is reported within debt. Finance lease assets are depreciated over the shorter of the lease term and its useful life. The interest element of the lease payment is charged against income over the lease term based on the effective interest rate method. Operating leases exist when substantially all of the risks and rewards of ownership are not transferred to the Group. Payments made under operating leases are charged against income on a straight-line basis over the period of the lease.

Where the Group is the lessor. Certain assets, mainly Diagnostics instruments, are leased to third party customers through both finance and operating lease arrangements. Such transactions may be entered into in separate contracts or in combined contracts including reagents and other consumables and services.

- Finance leases: Finance lease assets are reported as receivables at an amount equal to the net investment in the lease. Sales from finance leases are recognised at amounts that represent the fair value of the instrument, which approximates the present value of the minimum lease payments under the arrangement. Finance income for finance lease arrangements longer than twelve months is deferred and subsequently recognised based on a pattern that approximates the use of the effective interest method and recorded in royalty and other operating income.
- Operating leases: Sales from operating leases are recognised on a straight-line basis over the lease term or, when lease revenue is entirely variable and subject to subsequent reagent sales, as the performance obligation for reagents are satisfied.

Sales, net of discounts, are based on estimates regarding the related obligations, including their stand-alone selling prices or fair values. It requires judgement to determine when different obligations are satisfied, including whether enforceable purchase commitments for further obligations exist and when they arise.

Mergers and acquisitions

Business combinations. Business combinations are accounted for using the acquisition method of accounting. At the date of the acquisition the Group initially recognises the fair value of the identifiable assets acquired, the liabilities assumed and any non-controlling interest in the acquired business. The consideration transferred is measured at fair value at the date of acquisition. Where the Group does not acquire 100% ownership of the acquired business, non-controlling interests are recorded either at fair value or as the proportion of the fair value of the acquired net assets attributable to the non-controlling interest. Directly attributable acquisition-related costs are expensed as incurred within general and administration expenses.

Asset acquisitions. Asset acquisitions are acquisitions of legal entities that do not qualify as business combinations. At the date of the acquisition the Group initially recognises the individual identifiable assets acquired and liabilities assumed. The cost representing the cash consideration paid at the date of the acquisition is allocated to the individual identifiable assets and liabilities at the date of the acquisition. Subsequent consideration for performance-related development milestones is recognised as intangible assets when the specific milestones have been achieved. Such transactions do not give rise to goodwill. Directly attributable acquisition-related costs are expensed as incurred within general and administration expenses.

Goodwill

Goodwill arises in a business combination and is the excess of the consideration transferred to acquire the business over the underlying fair value of the net identified assets acquired. Goodwill is not amortised but is tested for impairment at least annually and upon the occurrence of an indication of impairment.

Intangible assets

Purchased patents, licences, trademarks and other intangible assets are initially recorded at cost. Assets that have been acquired through a business combination are initially recorded at fair value. Once available for use, intangible assets are amortised on a straight-line basis over their useful lives. Intangible assets are reviewed for impairment at each reporting date. The estimated useful life is the lower of the legal duration and the economic useful life. The estimated useful lives of intangible assets are regularly reviewed. Estimated useful lives of major classes of amortisable intangible assets are as follows:

Product intangibles in use	up to 20 years
Marketing intangibles in use	up to 10 years
Technology intangibles in use	up to 14 years

Impairment of property, plant and equipment and intangible assets

An impairment assessment is carried out when there is evidence that an asset may be impaired. In addition, intangible assets that are not yet available for use are tested for impairment annually. When the recoverable amount of an asset, being the higher of its fair value less costs of disposal and its value in use, is less than its carrying value, then the carrying value is reduced to its recoverable amount. This reduction is reported in the income statement as an impairment loss. Value in use is calculated using estimated cash flows, generally over a five-year period, with extrapolating projections for subsequent years. These are discounted using an appropriate long-term interest rate. When an impairment loss arises, the useful life of the asset is reviewed and, if necessary, the future depreciation/amortisation charge is accelerated. If the amount of impairment loss subsequently decreases and the decrease can be related objectively to an event occurring after the impairment was recognised, then the previously recognised impairment loss is reversed through the income statement as an impairment reversal.

Impairment of goodwill

Goodwill is assessed for impairment at each reporting date and is additionally tested annually for impairment. Goodwill is allocated to cash-generating units and when the recoverable amount of the cash-generating unit, being the higher of its fair value less costs of disposal or its value in use, is less than its carrying value, then the carrying value of the goodwill is reduced to its recoverable amount. This reduction is reported in the income statement as an impairment loss. When an acquired business that is included within a cash-generating unit permanently ceases to operate then it is treated as a disposal of that business. For separately identifiable goodwill that was generated on the initial acquisition of that business and where all of the factors that made up that goodwill are entirely unrelated to the continuing operations of the cash-generating unit, then the goodwill is deemed to have been disposed of and is fully impaired. The impairment testing methodology is further described in Note 9.

Inventories

Inventories are stated at the lower of cost and net realisable value. The cost of finished goods, work in process and intermediates includes raw materials, direct labour and other directly attributable costs and overheads based upon the normal capacity of production facilities. Cost is determined using the weighted average method. Net realisable value is the estimated selling price less cost to completion and selling expenses.

Receivables, including accounts receivable

Policy applicable from 1 January 2018. Receivables are carried at the original invoice amount less allowances made for doubtful accounts, trade discounts, cash discounts, volume rebates and similar allowances. A receivable represents a right to consideration that is unconditional and excludes contract assets. An allowance for doubtful accounts is recorded for expected credit losses over the term of the receivables. These estimates are based on specific indicators, such as the ageing of customer balances, specific credit circumstances and the Group's historical loss rates for each category of customers, and adjusted for forward-looking macroeconomic data. Expenses for doubtful trade receivables are recognised within marketing and distribution expenses. Trade discounts, cash discounts, volume rebates and similar allowances are recorded on an accrual basis consistent with the recognition of the related sales, using estimates based on existing contractual obligations, historical trends and the Group's experience.

Receivables are written off (either partly or in full) when there is no reasonable expectation of recovery. Where receivables have been written off, the Group continues to engage in enforcement activities to attempt to recover the receivable due. Where recoveries are made, these are recognised in profit or loss.

For trade and lease receivables, the Group applies the simplified approach prescribed by IFRS 9, which requires/permits the use of the lifetime expected loss provision from initial recognition of the receivables. The Group measures an allowance for doubtful accounts equal to the credit losses expected over the lifetime of the trade and lease receivables.

Policy applicable before 1 January 2018. Receivables are carried at the original invoice amount less allowances made for doubtful accounts, trade discounts, cash discounts, volume rebates and similar allowances. An allowance for doubtful accounts is recorded where there is objective evidence that the Group will not be able to collect all amounts due. These estimates are based on specific indicators, such as the ageing of customer balances, specific credit circumstances and the Group's historical experience, taking also into account economic conditions. Expenses for doubtful trade receivables are recognised within marketing and distribution expenses. Trade discounts, cash discounts, volume rebates and similar allowances are recorded on an accrual basis consistent with the recognition of the related sales, using estimates based on existing contractual obligations, historical trends and the Group's experience.

Cash and cash equivalents

Cash and cash equivalents include cash on hand and time, call and current balances with banks and similar institutions. Such balances are only reported as cash equivalents if they are readily convertible to known amounts of cash, are subject to insignificant risk of changes in their fair value and have a maturity of three months or less from the date of acquisition.

Provisions and contingencies

Provisions are recognised where a legal or constructive obligation has been incurred which will probably lead to an outflow of resources that can be reliably estimated. In particular, restructuring provisions are recognised when the Group has a detailed formal plan that has either commenced implementation or has been announced. Provisions are recorded for the estimated ultimate liability that is expected to arise and are discounted when the time value of money is material. A contingent liability is disclosed where the existence of the obligation will only be confirmed by future events or where the amount of the obligation cannot be measured with reasonable reliability. Contingent assets are not recognised, but are disclosed where an inflow of economic benefits is probable.

Fair values

Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. It is determined by reference to quoted market prices or by the use of established valuation techniques such as option pricing models and the discounted cash flow method if quoted prices in an active market are not available.

Financial instruments

Policy applicable from 1 January 2018. From 1 January 2018 the Group classifies its financial instruments in the following measurement categories which are disclosed in Note 30: amortised cost; fair value through OCI; fair value through OCI – equity investments; or fair value through profit or loss (including hedging instruments).

The classification depends on the Group's business model for managing the financial assets and the contractual terms of the cash flows. The Group reclassifies debt securities and financial assets at amortised cost when and only when its business model for managing those assets changes.

At initial recognition, the Group measures a financial asset at its fair value plus, in the case of a financial asset not at fair value through profit or loss, transaction costs that are directly attributable to the acquisition of the financial asset. Transaction costs of financial assets carried at fair value through profit or loss are expensed in profit or loss.

Amortised cost. Assets that are held for collection of contractual cash flows where those cash flows represent solely payments of principal and interest are measured at amortised cost, less provision for impairment. A gain or loss on a debt security that is subsequently measured at amortised cost and is not part of a hedging relationship is recognised in profit or loss when the asset is derecognised or impaired. Interest income from these financial assets is included in other financial income using the effective interest rate method. Assets at amortised cost are mainly comprised of accounts receivable, cash and cash equivalents and time accounts over three months.

Fair value through other comprehensive income (fair value through OCI). These are financial assets that are held for collection of contractual cash flows and for selling the financial assets, where the assets' cash flows represent solely payments of principal and interest. Those are initially recorded and subsequently carried at fair value. Changes in the fair value are recorded in other comprehensive income, except for the recognition of impairment gains or losses, interest revenue and foreign exchange gains and losses which are recognised in profit or loss. When the financial asset is derecognised, the cumulative gain or loss previously recognised in OCI is reclassified from equity to profit or loss. Interest income from these financial assets is included in other financial income using the effective interest rate method. Fair value through other comprehensive income assets are mainly comprised of money market instruments and debt securities.

Equity investments at fair value through other comprehensive income (fair value through OCI). These are equity investments in private biotechnology companies, which are kept as part of the Group's strategic alliance efforts. These assets are subsequently measured at fair value. Dividends are recognised as other financial income in profit or loss unless the dividend clearly represents a recovery of part of the cost of the investment. Other net gains and losses are recognised in OCI and included in the fair value reserve. When such an asset is derecognised, the cumulative gain or loss previously recognised in OCI is reclassified within equity from the fair value reserve to retained earnings and never to profit or loss.

Fair value through profit or loss. These are financial assets whose performance is evaluated on a fair value basis. A gain or loss on a financial asset that is subsequently measured at fair value through profit or loss and is not part of a hedging relationship is recognised in profit or loss and presented within other financial income (expense) in the period in which it arises. Fair value through profit or loss assets are mainly comprised of equity investments/securities. Contingent consideration liabilities are initially recorded and subsequently carried at fair value with changes in fair value recorded in general and administration within the operating results of the income statement.

Fair value through profit or loss – hedging instruments. These are derivative financial instruments that are used to manage the exposures to foreign currency, interest rate, equity market and credit risks. These instruments are initially recorded and subsequently carried at fair value. Apart from those derivatives designated as qualifying cash flow hedging instruments, all changes in fair value are recorded as other financial income (expense).

Policy applicable before 1 January 2018. Financial instruments were classified into the following categories which are disclosed in Note 30: available-for-sale; fair value – hedging instruments; fair value – designated; loans and receivables.

Available-for-sale. These are non-derivative financial assets that are either designated as such or are not classified in any other financial asset category. Available-for-sale assets are initially recorded and subsequently carried at fair value. Changes in fair value are recorded in other comprehensive income, except for impairments and interest and foreign exchange components. When an investment is derecognised, the cumulative gains and losses in equity are reclassified to other financial income (expense). Available-for-sale assets are mainly comprised of marketable securities.

Fair value – hedging instruments. These are derivative financial instruments that are used to manage the exposures to foreign currency, interest rate, equity market and credit risks. Derivative financial instruments are initially recorded and subsequently carried at fair value. Apart from those derivatives designated as qualifying cash flow hedging instruments, all changes in fair value are recorded as other financial income (expense).

Fair value – designated. These are non-derivative financial instruments that are designated as fair value through profit or loss on initial recognition. Designated fair value instruments are initially recorded and subsequently carried at fair value with changes in fair value recorded in the income statement. Designated fair value instruments are mainly comprised of contingent consideration liabilities with changes in fair value recorded in general and administration within the operating results.

Loans and receivables. These are non-derivative financial assets with fixed or determinable payments that are not quoted in an active market. Loans and receivables are initially recorded at fair value and subsequently carried at amortised cost using the effective interest rate method, less any impairment losses. Loans and receivables are mainly comprised of accounts receivable and cash and cash equivalents.

No change in policies on 1 January 2018 for the following items:

Other financial liabilities. These are non-derivative financial liabilities. Other financial liabilities are initially recorded at fair value, less transaction costs, and subsequently carried at amortised cost using the effective interest rate method. Other financial liabilities are mainly comprised of debt and trade payables.

Debt. Debt instruments are initially recorded at cost, which is the proceeds received, net of transaction costs. Subsequently they are reported at amortised cost. Any discount between the net proceeds received and the principal value due on redemption is amortised over the duration of the debt instrument and is recognised as part of financing costs using the effective interest rate method.

A financial asset is derecognised when the contractual cash flows from the asset expire or when the Group transfers the rights to receive the contractual cash flows from the financial assets in a transaction in which substantially all the risks and rewards of ownership of the financial asset are transferred. A financial liability is derecognised when the contractual obligations are discharged, cancelled or expire.

Impairment of financial assets

Policy applicable from 1 January 2018. The Group recognises loss allowances for expected credit losses ('ECL') for financial assets measured at amortised cost and debt securities measured at fair value through OCI.

For trade and lease receivables the Group measures the allowance for doubtful accounts at an amount equal to lifetime ECL.

For debt securities carried at fair value through OCI and debt securities and other financial assets at amortised cost, which are determined to have low credit risk based on external credit ratings of the counterparties, the Group measures loss allowances at an amount equal to 12-month ECL. The Group considers debt securities to have low credit risk when their credit risk rating is equivalent to the globally understood definition of 'investment grade'. The Group considers this to be at least Baa3 from Moody's and BBB- from Standard & Poor's. When the credit risk of debt securities carried at fair value through OCI and debt securities and other financial assets at amortised cost has increased significantly since their initial recognition, the Group measures loss allowances at an amount equal to lifetime ECL. The Group assumes that the credit risk of such instruments have increased significantly if they are more than 30 days past due.

Financial assets are written off (either partially or in full) when there is no realistic prospect of recovery. This is generally the case when the Group determines that the customer does not have assets or sources of income that could generate sufficient cash flows to repay the amounts subject to the write-off. However, financial assets that are written off are still subject to enforcement activities in order to comply with the Group's policy for recovery of amounts due.

Policy applicable before 1 January 2018. Financial assets are individually assessed for possible impairment at each reporting date. An impairment charge is recorded where there is objective evidence of impairment, such as where the issuer is in bankruptcy, default or other significant financial difficulty. Available-for-sale equity securities that have a market value of more than 25% below their original cost, or have a market value below their original cost for a sustained six-month period will be considered as impaired.

For financial assets carried at amortised cost, any impairment charge is the difference between the carrying value and the recoverable amount, calculated using estimated future cash flows discounted using the original effective interest rate. For available-for-sale financial assets, any impairment charge is the amount currently carried in other comprehensive income for the difference between the original cost and the fair value.

An impairment loss is reversed if the reversal can be related objectively to an event occurring after the impairment loss was recognised. For debt securities measured at amortised cost or available-for-sale, the reversal is recognised in income. For equity securities held as available-for-sale, the reversal is recognised directly in other comprehensive income.

Hedge accounting

The Group uses derivatives to manage its exposures to foreign currency, interest rate, equity market and credit risks. The instruments used may include interest rate swaps, cross-currency swaps, forwards contracts and options. The Group generally limits the use of hedge accounting to certain significant transactions. To qualify for hedge accounting, the hedging relationship must meet several strict conditions on eligibility of hedging and hedged instruments, formal designation and documentation, as well as hedge effectiveness and reliability of measurement. While many of these transactions can be considered as hedges in economic terms, if the required conditions are not met, then the relationship does not qualify for hedge accounting. In this case the hedging instrument and the hedged item are reported independently as if there were no hedging relationship, which means that any derivatives are reported at fair value, with changes in fair value included in other financial income (expense).

Cash flow hedge. This is a hedge of the exposure to variability in cash flows that is attributable to a particular risk associated with a recognised asset or liability or a highly probable forecast transaction and could affect profit or loss. The hedging instrument is recorded at fair value. The effective portion of the hedge is included in other comprehensive income and any ineffective portion is reported in other financial income (expense). If the hedging relationship is the hedge of the foreign currency risk of a firm commitment or highly probable forecasted transaction that results in the recognition of a non-financial item, the cumulative changes in the fair value of the hedging instrument that have been recorded in other comprehensive income are included in the initial carrying value of the non-financial item at the date of recognition. For all other cash flow hedges, the cumulative changes in the fair value of the hedging instrument that have been recorded in other comprehensive income are included in other financial income (expense) when the forecasted transaction affects net income.

Fair value hedge. This is a hedge of the exposure to changes in fair value of a recognised asset or liability, or an unrecognised firm commitment, or an identified portion of such an asset, liability or firm commitment, that is attributable to a particular risk and could affect profit or loss. The hedging instrument is recorded at fair value and the hedged item is recorded at its previous carrying value, adjusted for any changes in fair value that are attributable to the hedged risk. Changes in the fair values are reported in other financial income (expense).

Taxation

Income taxes include all taxes based upon the taxable profits of the Group, including withholding taxes payable on the distribution of retained earnings within the Group. Other taxes not based on income, such as property and capital taxes, are included within general and administration expenses.

Liabilities for income taxes, mainly withholding taxes, which could arise on the remittance of retained earnings, principally relating to subsidiaries, are only recognised where it is probable that such earnings will be remitted in the foreseeable future. Where the amount of tax liabilities is uncertain, accruals are recorded within income tax liabilities for management's best estimate of the ultimate liability that is expected to arise based on the specific circumstances and the Group's historical experience.

Deferred tax assets and liabilities are recognised on temporary differences between the tax bases of assets and liabilities and their carrying values. Deferred tax assets are recognised to the extent that it is probable that future taxable profit will be available against which the unused tax losses can be utilised.

Current and deferred tax assets and liabilities are offset when the income taxes are levied by the same taxation authority and when there is a legally enforceable right to offset them. Deferred taxes are determined based on the currently enacted tax rates applicable in each tax jurisdiction where the Group operates.

Own equity instruments

The Group's holdings in its own equity instruments are recorded as a deduction from equity. The original purchase cost, consideration received for subsequent resale of these equity instruments and other movements are reported as changes in equity. These instruments are held for the Group's potential conversion obligations that may arise from the Group's equity compensation plans.

Changes in accounting policies

In 2018 the Group implemented the following new standards, including any consequential amendments to other standards, with a date of initial application of 1 January 2018.

- IFRS 9 'Financial Instruments'
- IFRS 15 'Revenue from Contracts with Customers'
- 'Definition of a Business' (Amendments to IFRS 3)

The Group has also implemented various other minor amendments to existing standards and interpretations, which have no material impact on the Group's overall results and financial position.

None of the new standards, revised standards, amended standards or interpretations have a material impact on the Group's overall results and financial position. The nature and the effects of the changes most relevant to the Group's financial statements are given below.

IFRS 9 'Financial Instruments'

Effective 1 January 2018 the Group has implemented IFRS 9 'Financial Instruments'. The new standard replaces IAS 39 'Financial Instruments: Recognition and Measurement'. The standard deals with the classification, recognition and measurement (including impairment) of financial instruments and also introduces a new hedge accounting model. The new standard results in an increased volume of disclosure information in the Annual Financial Statements.

Classification and measurement of financial instruments. Previously all marketable securities were classified as available-for-sale under IAS 39. Under the new standard, equity securities are classified as fair value through profit or loss, debt securities and money market instruments as fair value through other comprehensive income (OCI) and time accounts over three months as amortised cost. The Group elected to classify certain strategic equity investments as fair value through OCI. When such strategic equity investments are sold, the cumulative amount included in the fair value reserve is transferred to retained earnings.

Impairment of financial assets. On 1 January 2018 the Group changed the methodology of assessing impairment of its financial assets from the incurred loss model (used in IAS 39) to the expected credit loss model (used in IFRS 9). In accordance with the transitional provisions of IFRS 9, the Group has not restated prior periods but it has reassessed the impairment allowances under the new approach as of 1 January 2018.

Hedge accounting. The new standard also introduces a new hedge accounting model which requires hedge accounting relationships to be based upon the Group's own risk management strategy and objectives and to be discontinued only when the relationships no longer qualify for hedge accounting. The Group has applied the revised hedge accounting guidance to its hedging relationships prospectively with effect from 1 January 2018. All hedge accounting relationships designated under the previous IAS 39 guidance have continued to be valid hedge accounting relationships in accordance with IFRS 9.

Transition approach. The Group has applied the exemption from full retrospective application for the classification and measurement requirements, including impairment, meaning that the comparative 2017 results have not been restated. Differences in the carrying amounts of financial assets and reclassification adjustments from the adoption of IFRS 9 are recognised in retained earnings and reserves as at 1 January 2018. Accordingly, the information presented for 2017 does not generally reflect the requirements of IFRS 9 but rather those of IAS 39.

Presentational changes. As a result of implementing IFRS 9, the Group has made a number of presentational changes to the statement of comprehensive income, statement of changes in equity, and to Notes 4, 13, 15 and 30.

Impact from the initial application of IFRS 9. The impact from the initial application of IFRS 9 on the Group's consolidated balance sheet and the Group's consolidated equity is as follows:

Revised Roche Group consolidated balance sheet (selected items) in millions of CHF

	Balance at 1 January 2018	Application of IFRS 9	Balance at 1 January 2018 (revised)
Accounts receivable	9,577	(6)	9,571
Deferred tax assets	3,576	1	3,577
Total net assets	**29,007**	**(5)**	**29,002**
Capital and reserves attributable to Roche shareholders	26,441	(5)	26,436
Total equity	**29,007**	**(5)**	**29,002**

Revised Roche Group consolidated equity (selected items) in millions of CHF

	Balance at 1 January 2018	Application of IFRS 9 (net of tax)	Balance at 1 January 2018 (revised)
Retained earnings	33,266	105	33,371
Fair value reserves	158	(110)	48
Total equity	**29,007**	**(5)**	**29,002**

There was a reclassification within equity of CHF 110 million, net of tax, transferred from fair value reserves to retained earnings on 1 January 2018 which related to unrealised gains for equity instruments/investments due to their reclassification as fair value through profit or loss (previously classified as available-for-sale). In addition, there was a decrease of CHF 5 million, net of tax, in retained earnings due to additional bad debt allowance on trade and lease receivables resulting from applying the expected credit loss model (used in IFRS 9).

The following table reconciles the carrying amounts of financial assets under IAS 39 to the carrying amounts under IFRS 9 on transition to IFRS 9 on 1 January 2018. There were no reclassifications for financial liabilities.

Reclassifications of financial instruments on adoption of IFRS 9 in millions of CHF

	Measurement category Original (IAS 39)	New (IFRS 9)	Balance at 1 January 2018	Remeasurement from application of IFRS 9	Balance at 1 January 2018 (revised)
Current financial assets					
– Accounts receivable	Loans and receivables	Amortised cost	9,577	(6)	9,571
– Equity securities	Available-for-sale	Fair value through profit or loss	10	0	10
– Debt securities	Available-for-sale	Fair value through OCI	1,161	0	1,161
– Money market instruments	Available-for-sale	Fair value through OCI	3,019	0	3,019
– Time accounts over three months	Available-for-sale	Amortised cost	3,088	0	3,088
– Derivative financial instruments	Fair value through profit or loss	Fair value through profit or loss	97	0	97
– Other financial current assets	Loans and receivables	Amortised cost	896	0	896
Non-current financial assets					
– Equity investments at fair value through OCI	Available-for-sale	Fair value through OCI	267	0	267
– Equity investments at fair value through profit or loss	Available-for-sale	Fair value through profit or loss	279	0	279
– Other financial non-current assets	Loans and receivables	Amortised cost	139	0	139

IFRS 15 'Revenue from Contracts with Customers'

Effective 1 January 2018 the Group has implemented IFRS 15 'Revenue from Contracts with Customers'. The new standard replaces IAS 18 'Revenue' and IAS 11 'Construction Contracts'. IFRS 15 establishes a comprehensive framework for determining whether, how much and when revenue is recognised, and also contains new requirements related to presentation. The core principle in the framework is that revenue should be recognised dependent on the transfer of promised goods or services to the customer for an amount that reflects the consideration which should be received in exchange for those goods or services. The objective of the standard is to provide a five-step approach to revenue recognition that includes identifying contracts with customers, identifying performance obligations, determining transaction prices, allocating transaction prices to performance obligations, and recognising revenue when or as performance obligations are satisfied. Judgement needs to be applied, including making estimates and assumptions, for multiple-element contracts in identifying performance obligations, in constraining estimates of variable consideration and in allocating the transaction price to each performance obligation and to lease components (if any), particularly in the Diagnostics business and for out-licensing agreements. The new standard results in an increased volume of disclosure information in the Annual Financial Statements.

Changes introduced by the standard relevant to the Roche Group. The new standard provides additional requirements and guidance that are relevant to the Group, notably on the following areas:

- Revenue from licences of intellectual property, including sales-based royalties, on constraining estimates of variable consideration such as e.g. development milestones, and on providing a material right to receive additional goods free of charge under certain patient access programmes that may be regarded as a separate performance obligation. There is no material impact from these changes.
- The new standard also clarifies how to allocate sales, including the treatment of discounts, to each element in multiple-elements contracts and when to recognise sales for each of those elements. Such contracts are entered into in the Diagnostics Division and typically include obligations for instruments (including those provided under leasing arrangements), reagents and other consumables, and services. It requires the use of estimates and assumptions and some judgement to apply this guidance in practice. There is no material impact from this guidance.
- Out-licensing agreements in the Pharmaceuticals Division may be entered into with no further obligation or may include commitments to conduct research, late-stage development, regulatory approval, co-marketing or manufacturing. These may be settled by a combination of up-front payments, milestone payments, other licensing fees, and reimbursements for services provided. Whether to consider these commitments as a single performance obligation or separate ones, or even being in scope of IFRS 15, is not straightforward and requires some judgement. Depending on the conclusion, this may result in all revenue being calculated at inception and either being recognised at once or spread over the term of a longer performance obligation. The answers under the new standard may be different from those currently used. The new standard provides an exemption for sales-based royalties for licences of intellectual property which will continue to be recognised as revenue as underlying sales are incurred.

Transition approach and use of practical expedients. The Group has applied the full retrospective method for the transition. Certain practical expedients permitted by the standard during the transition have also been used, notably:

- the relief to not restate contracts that began and were completed in 2017 or were completed before 1 January 2017; and
- the relief to not provide in 2018 the disclosure requirement as per IFRS 15 paragraph 120 for the comparative 2017 period ('amount of the transaction price allocated to the remaining performance obligations').

Since the new standard, including the use of practical expedients, has not modified the timing or amounts of revenue recognised for 2017, no restatement has been necessary.

Presentational changes. As a result of implementing IFRS 15, the Group has also made a presentational change to the income statement to include a subtotal 'Revenue', and has created a new note for 'Revenue' as Note 3.

'Definition of a Business' (Amendments to IFRS 3)

In October 2018 the International Accounting Standards Board issued amendments to IFRS 3 'Business Combinations'. The amendments further clarify the definition of a business and add an optional 'concentration test' to aid the assessment of whether a transaction represents a business combination or is simply in substance the purchase of a single asset or group of similar assets. These amendments are mandatory from 2020 and may be early adopted. The amendments are particularly relevant for many of the acquisitions carried out by the Group, since the value in the acquired companies often largely consists of the rights to a single product or technology. Therefore, effective 1 January 2018, the Group has early implemented these amendments, with prospective application and with no restatement of comparative period information.

Note 6 has been expanded and renamed as 'Mergers and acquisitions' to include both transactions accounted for as business combinations and asset acquisitions. Asset acquisitions are acquisitions of legal entities that do not qualify as business combinations under IFRS 3. Cash consideration paid for asset acquisitions at the transaction date and subsequent additional contingent payments made upon the achievement of performance-related development milestones are now presented in the line 'Asset acquisitions' as disclosed in Note 6. Subsequent consideration for performance-related development milestones for transactions treated as asset acquisitions is recognised as intangible assets when the specific milestones have been achieved. Previously intangible assets acquired in asset acquisitions were included in the line items 'Purchase of intangible assets' in the statement of cash flows and 'Additions' in Note 10 'Intangible assets'.

Future new and revised standards

The Group is currently assessing the potential impacts of the various new and revised standards and interpretations that will be mandatory from 1 January 2019 which the Group has not yet applied. Based on the analysis to date, the Group does not anticipate that these will have a material impact on the Group's overall results and financial position except for the effects from the implementation of IFRS 16 'Leases' as summarised below.

IFRS 16 'Leases'

The Group will implement the new standard effective 1 January 2019. IFRS 16 will replace existing leases guidance, including IAS 17 'Leases', and sets out the principles for recognition and measurement of leases. The new standard will also result in an increased volume of disclosure information in the Annual Financial Statements.

The main effect on the Group is that IFRS 16 introduces a single, on-balance sheet lease accounting model for lessees. It requires a lessee to recognise assets and liabilities for almost all leases, including operating leases. The Group has assessed the potential impact and expects the carrying value of leased assets to increase by approximately CHF 1.2 billion, with lease liabilities expected to increase by a similar amount at the date of implementation. The application of the new standard will result in part of what are currently reported as operating lease costs being recorded as interest expenses. Given the leases involved and the current low interest rate environment, the Group does not currently expect this effect to be material. The Group is currently finalising the exact impact of the new standard.

Transition approach and use of practical expedients. The Group will apply the cumulative catch-up method for the transition. Therefore the cumulative effect of adopting IFRS 16 will be recognised as an adjustment to the opening balance of retained earnings at 1 January 2019, with no restatement of comparative information. Some practical expedients permitted by the standard will also be used, notably to not reassess upon transition whether an existing contract contains a lease, and the recognition exemptions for short-term leases and leases of low-value assets.

Presentational changes. As a result of implementing IFRS 16, the Group will make a number of presentational changes in 2019, notably to present 'Right-of-use assets' as a separate line item in the balance sheet and to include lease liabilities in other current and non-current liabilities. A new note for 'Leases' will be created to include the increased volume of required disclosure information.

Report of Roche Management on Internal Control over Financial Reporting

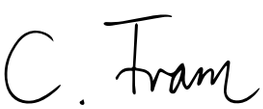
Report of Roche Management on Internal Control over Financial Reporting

The Board of Directors and management of Roche Holding Ltd are responsible for establishing and maintaining adequate control over financial reporting. The internal control system was designed to provide reasonable assurance over the reliability of financial reporting and the preparation and fair presentation of consolidated financial statements in accordance with International Financial Reporting Standards.

All internal control systems, no matter how well designed, have inherent limitations. Therefore, even those systems determined to be effective may not prevent or detect misstatements and can provide only reasonable assurance with respect to financial statement preparation and presentation. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions or that the degree of compliance with the policies or procedures may deteriorate.

Management assessed the effectiveness of its system of internal control over financial reporting as of 31 December 2018 based on the criteria for effective internal control over financial reporting described in *Internal Control – Integrated Framework 2013* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). Based on this assessment, management has concluded that the system of internal control over financial reporting was effective as of 31 December 2018.

The Statutory Auditor KPMG AG has audited the consolidated financial statements of Roche Holding Ltd for the year ended 31 December 2018, in accordance with Swiss Auditing Standards and with the International Standards on Auditing (ISA). They have also issued a report on the effectiveness of the Group's system of internal control over financial reporting. This report is set out on pages 150 to 151.



Christoph Franz
Chairman of the Board of Directors

Alan Hippe
Chief Financial Officer

Basel, 28 January 2019

KPMG

Statutory Auditor's Report

To the General Meeting of Roche Holding Ltd, Basel

Report on the Audit of the Consolidated Financial Statements

Opinion

We have audited the consolidated financial statements of Roche Holding Ltd and its subsidiaries (the Group), which comprise the consolidated balance sheet as at 31 December 2018 and the consolidated income statement, consolidated statement of comprehensive income, consolidated statement of changes in equity and consolidated statement of cash flows for the year then ended, and notes to the consolidated financial statements, including a summary of significant accounting policies.

In our opinion the consolidated financial statements (pages 40 to 140) give a true and fair view of the consolidated financial position of the Group as at 31 December 2018, and its consolidated financial performance and its consolidated cash flows for the year then ended in accordance with International Financial Reporting Standards (IFRS) and comply with Swiss law.

Basis for Opinion

We conducted our audit in accordance with Swiss law, International Standards on Auditing (ISAs) and Swiss Auditing Standards. Our responsibilities under those provisions and Standards are further described in the Auditor's Responsibilities for the Audit of the Consolidated Financial Statements section of our report. We are independent of the Group in accordance with the provisions of Swiss law and the requirements of the Swiss audit profession, as well as the IESBA Code of Ethics for Professional Accountants, and we have fulfilled our other ethical responsibilities in accordance with those requirements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Key Audit Matters

Chargebacks, other rebates and sales returns in the US pharmaceuticals business

Carrying value of the InterMune goodwill relating to the Pharmaceuticals Division

Carrying value of product intangible assets

Uncertain tax positions

Acquisition of Flatiron Health, Inc.

Key audit matters are those matters that, in our professional judgement, were of most significance in our audit of the consolidated financial statements of the current period. These matters were addressed in the context of our audit of the consolidated financial statements as a whole, and in forming our opinion thereon, and we do not provide a separate opinion on these matters.

KPMG

Chargebacks, other rebates and sales returns in the US pharmaceuticals business

Key Audit Matter

The Group's pharmaceuticals business makes sales to various customers in the US that fall under certain commercial and government-mandated contracts, purchasing and reimbursement arrangements, of which the most significant are Medicaid and the 340B Drug Discount Program. The Group also provides a right of return to its US customers for certain products, with return periods that in some cases extend several years into the future. These arrangements result in deductions to gross amounts invoiced in arriving at revenue and create obligations for the Group to provide customers with chargebacks or other rebates and to give credit for sales returns. The estimated amounts are deducted from gross sales and recorded as accrued liabilities (rebates) or provisions for sales returns, or as a deduction from accounts receivable (chargebacks). These estimates are based on analyses of existing contractual or legislatively mandated obligations, historical trends and the Group's experience.

Management has determined accrued liabilities and deductions to accounts receivable for expected chargebacks and other rebates, predominantly Medicaid, of CHF 1,441 million to be necessary at 31 December 2018. Additionally, provisions for sales returns mainly relating to products at or near loss of exclusivity of CHF 455 million were recorded at 31 December 2018.

We focused on this area because the arrangements are complex and because establishing an appropriate year-end position requires significant judgement and estimation by management. The assumptions required for estimating provisions for sales returns are also made more complicated given the recent or impending loss of exclusivity in the US for some of the Group's pharmaceutical products.

Our response

Our audit procedures included, amongst others, on a sample basis, obtaining management's calculations for accrued liabilities, provisions and accounts receivable deductions, recalculating the amounts and validating the reasonableness of key assumptions used by reference to internal and external sources including the terms of the applicable contracts, US government pricing information, historical chargebacks and other rebates, historical sales returns levels and to current trends.

We considered the accuracy of management's estimates in previous years by comparing historical accrued liabilities, provisions and accounts receivable deductions recorded to the actual settlements. We also assessed changes in the accrual rates used within the estimates for 2018, including responding to an increase in the utilisation of the 340B Drug Discount Program in 2018, by comparing the accrual rates to current chargeback, other rebate payment and sales return trends.

We considered the adequacy of the Group's revenue recognition accounting policies, including the recognition and measurement of deductions to gross sales relating to chargebacks, other rebates and sales returns and related disclosures.

For further information on chargebacks, other rebates and sales returns in the US pharmaceuticals business refer to the following:

Page 127 (Significant accounting policies, note 33), page 46 (General accounting principles – Key accounting judgements, estimates and assumptions, note 1) and pages 51, 76 and 79–84 (Financial disclosures, note 3 Revenue, note 12 Accounts receivable, note 19 Other current liabilities and note 20 Provisions and contingent liabilities).

KPMG

Carrying value of the InterMune goodwill relating to the Pharmaceuticals Division

Key Audit Matter

At 1 January 2018, the Group held goodwill of CHF 4,870 million arising from past acquisitions of the Pharmaceuticals Division, principally Genentech and InterMune together with smaller technology transactions and product transactions. Goodwill is tested annually for impairment and in addition is assessed for impairment at the reporting date.

During the year management undertook a reassessment of the cash-generating units ('CGUs') used for allocating goodwill in the Pharmaceuticals Division. Management was required to apply judgement in allocating the goodwill to the appropriate businesses as well as in assessing the future performance and prospects of each CGU. Following on from this reassessment management recorded an impairment in respect of the InterMune goodwill of CHF 2,040 million.

Impairment testing uses projections of future cash flows based on the most recent long-term forecasts approved by management, including estimated sales volumes and pricing. The long-term forecasts are projected over five years.

We focused in particular on InterMune goodwill in light of the amount of judgement and estimation required, and the impairment recorded in the year.

Our response

Our audit procedures included, amongst others, assessing the Group's forecasting procedures and the integrity of the discounted cash flow models which management used to prepare the valuations. We challenged the robustness of the key assumptions used to determine the recoverable amounts, including identification of and allocation to the CGU (including management's reassessment of the CGUs in the year), forecast cash flows, growth rates and the discount rates based on our understanding of the commercial prospects of the products and the markets in which they are commercialised.

We did this by using our own valuation specialists to assist us in evaluating the assumptions and methodologies used by management, in particular those relating to the discount rates, by comparing relevant assumptions to industry and economic forecasts. In addition, we identified and analysed changes in assumptions from prior periods, made an assessment of the consistency of assumptions, and performed a comparison of assumptions with publicly available data. We also performed a retrospective assessment of the accuracy of management's past projections by comparing historical forecasts to actual results.

We also assessed whether the Group's disclosures about the sensitivity of the outcome of the impairment assessment to changes in key assumptions reflect the risks inherent in the valuation of goodwill.

For further information on the carrying value of goodwill relating to the Pharmaceuticals Division refer to the following:

Page 127 (Significant accounting policies, note 33), page 46 (General accounting principles – Key accounting judgements, estimates and assumptions, note 1) and pages 68–71 (Financial disclosures, note 9 Goodwill).

KPMG

Carrying value of product intangible assets

Key Audit Matter

The Group has significant product intangible assets (31 December 2018 – CHF 8,956 million) acquired through business combinations or in-licensing arrangements. These comprise product intangibles in use (CHF 5,180 million) being amortised and product intangibles not available for use (CHF 3,776 million) not being amortised. An impairment assessment is carried out for all product intangibles when there is evidence that an asset may be impaired, with intangible assets that are not yet available for use also being tested for impairment annually.

Product intangibles in use (CHF 5,180 million) predominantly relate to acquired products that have been launched, with the key risk being the ability to successfully commercialise the products concerned. The largest single intangible asset arose on the acquisition of InterMune in 2014 and relates to Esbriet (CHF 2,413 million). We focused on this product intangible in use because of the previous impairments recorded, the low level of headroom and because the assessment of recoverability involves the forecasting and discounting of future cash flows, which is inherently judgemental. Key estimates and assumptions include revenue growth, the timing and impact of loss of exclusivity, discount rates and the development and commercialisation of competing products. The drivers of revenue growth include persistence rate, treatment rate and market share.

Product intangibles not available for use (CHF 3,776 million) mostly represent in-process research and development assets. Due to the inherent uncertainties in the research and development processes, intangible assets not available for use are particularly at risk of impairment. The impairment assessment requires management to make key assumptions and judgements on the clinical, technical and commercial viability of the new products. Accordingly, we also focused our audit work on these areas. Risks include an inability to achieve successful trial results, obtain required clinical and/or regulatory approvals and a highly competitive business environment in the therapeutic areas where the Group has significant assets in research or development.

Our response

Our audit procedures included, amongst others, challenging the robustness of the key assumptions used to determine the recoverable amounts, including forecast revenues, useful lives and the discount rates. Our challenge was based on our understanding of the commercial prospects of the individual products, as well as the relevant business areas and markets in which they operate. We used our valuation specialists to assist us in evaluating the assumptions and methodologies used by management in relation to the discount rates. We made our own assessments in relation to key inputs such as projected pricing and volumes, and the products' projected share of the therapeutic area or *in vitro* diagnostic market, by comparing relevant assumptions to industry forecasts, reviewing analyst commentaries and by retrospective assessment of the accuracy of previous projections. We compared management's assumptions with external data where it was available, for example in the case of Esbriet. We performed sensitivity analysis over individual intangible asset impairment models to assess the level of sensitivity to key assumptions so we could focus our work on those areas and assess management's allowance for risk.

For product intangibles not yet available for use, our audit included assessing the reasonableness of management's assumptions regarding the probability of obtaining regulatory approval through comparison to industry practice, past history, and consideration of the Group's internal governance and approval processes. We also interviewed a number of senior research, development and commercial personnel in order to understand and challenge those assumptions.

For further information on the carrying value of product-related intangible assets refer to the following:

Page 127 (Significant accounting policies, note 33), page 46 (General accounting principles – Key accounting judgements, estimates and assumptions, note 1) and pages 72–75 (Financial disclosures, note 10 Intangible assets).

KPMG

Uncertain tax positions

Key Audit Matter

The Group operates across a wide range of different tax jurisdictions around the world and is thus subject to occasional challenges by local tax authorities in respect of cross-border transfer pricing arrangements for goods and services, financing and transaction-related tax matters in connection with the integration of investments, divestments and licensing contracts. Areas of particular focus include transfer pricing arrangements such as those relating to the Group's manufacturing and supply chains.

Where the amount of tax liabilities is uncertain, the Group recognises accruals that reflect management's best estimate of the outcome based on the facts known in the relevant jurisdiction. The Group has open tax and transfer pricing matters with various tax authorities where the range of possible outcomes is broad. At 31 December 2018, the Group has recognised current income tax liabilities of CHF 3,808 million which includes accruals for uncertain tax positions.

We focused on this area as the estimates of the amounts of tax receivable or payable require a significant level of expertise and judgement.

Our response

Our audit procedures included, amongst others, obtaining an understanding of uncertain tax positions through inquiry of employees of the tax department and management of affiliates. We reviewed documentation in relation to correspondence with tax authorities to verify whether tax exposures have been considered and provided for where necessary.

For significant items we challenged management's judgement regarding the eventual resolution with national tax authorities of double taxation conflicts, pending tax audits and estimates of tax exposures with the assistance of our local country tax specialists. For the most significant uncertain tax positions, our work included the consideration of third-party transfer pricing studies and the use, where available, of past experience with the tax authorities in the respective jurisdiction. Additionally we used our own tax specialists' expertise to assess the appropriateness of the key assumptions made by management and to conclude on a best estimate of the outcome.

Our audit approach included additional audit procedures performed at Group level to consider the more significant uncertain tax positions in particular for transfer prices applied for goods and services and intellectual property rights.

For further information on uncertain tax positions refer to the following:

Page 127 (Significant accounting policies, note 33), page 46 (General accounting principles – Key accounting judgements, estimates and assumptions, note 1) and pages 55–57 (Financial disclosures, note 5 Income taxes).

KPMG

Acquisition of Flatiron Health, Inc.

Key Audit Matter

The Group acquired Flatiron Health, Inc. ('Flatiron Health') on 5 April 2018 for a total consideration of USD 1,616 million. The consideration was primarily allocated to intangible assets and goodwill of CHF 695 million and CHF 1,128 million, respectively.

The acquisition of Flatiron Health required management to apply judgement in identifying and valuing the intangible assets and in the allocation of goodwill arising from the transaction to the cash-generating units benefitting from the synergies identified.

The key assumptions relating to the valuation of the intangible assets included revenue growth, the discount rate and the competitive environment. In particular, we focused on the valuation of Flatiron Health's technology platform which required additional consideration relating to the applied obsolescence rate.

The goodwill arising from the transaction was attributed to the Roche Pharmaceuticals cash-generating unit which reflects the benefits to the Group's oncology research and development activities through the use of Flatiron Health's real-world evidence.

Our response

Our audit procedures in relation to the acquisition of Flatiron Health included, amongst others, an inspection of the legal agreements supporting the transaction. We also examined information contained within due diligence and valuation reports as well as internal management presentations to the Board of Directors.

We challenged the appropriateness of the methodology used by management to value the identified intangible assets and compared the useful economic life of those intangible assets with similar technology platforms based on our understanding of the technology platform and the business areas in which Flatiron Health operates. In addition, we considered an appropriate range of alternative obsolescence rates.

With the support of our own valuation specialists we evaluated key estimates and assumptions used by management in the purchase price allocation. This evaluation focused on the appropriateness of the discount rate applied and key assumptions made regarding the revenue growth and competitive environment. We challenged these assumptions based on our sector expertise with reference to other transactions of a similar nature and by performing sensitivity analysis over key assumptions. Throughout our procedures we held inquiries of management's external valuers.

We obtained an understanding of how Flatiron Health's real-world evidence would be used within the Roche business and other expected synergies to justify the level of goodwill recognised on the acquisition and assessed the appropriateness of management's decision to allocate the goodwill to the Roche Pharmaceuticals cash-generating unit.

We have also assessed whether the Group's disclosures in relation to the acquisition meet the requirements of the relevant accounting standards.

For further information on acquisition of Flatiron Health, Inc. refer to the following:

Page 127 (Significant accounting policies, note 33), page 46 (General accounting principles – Key accounting judgements, estimates and assumptions, note 1) and pages 58–61 (Financial disclosures, note 6 Mergers and acquisitions).

KPMG

Other Information in the Annual Report

The Board of Directors is responsible for the other information in the annual report. The other information comprises all information included in the annual report, but does not include the consolidated financial statements, the stand-alone financial statements of the company, the remuneration report and our auditor's reports thereon.

Our opinion on the consolidated financial statements does not cover the other information in the annual report and we do not express any form of assurance conclusion thereon.

In connection with our audit of the consolidated financial statements, our responsibility is to read the other information in the annual report and, in doing so, consider whether the other information is materially inconsistent with the consolidated financial statements or our knowledge obtained in the audit, or otherwise appears to be materially misstated. If, based on the work we have performed, we conclude that there is a material misstatement of this other information, we are required to report that fact. We have nothing to report in this regard.

Responsibility of the Board of Directors for the Consolidated Financial Statements

The Board of Directors is responsible for the preparation of consolidated financial statements that give a true and fair view in accordance with IFRS and the provisions of Swiss law, and for such internal control as the Board of Directors determines is necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the consolidated financial statements, the Board of Directors is responsible for assessing the Group's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless the Board of Directors either intends to liquidate the Group or to cease operations, or has no realistic alternative but to do so.

Auditor's Responsibilities for the Audit of the Consolidated Financial Statements

Our objectives are to obtain reasonable assurance about whether the consolidated financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Swiss law, ISAs and Swiss Auditing Standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these consolidated financial statements.

As part of an audit in accordance with Swiss law, ISAs and Swiss Auditing Standards, we exercise professional judgment and maintain professional scepticism throughout the audit. We also:

— Identify and assess the risks of material misstatement of the consolidated financial statements, 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 opinion. 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 internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances.

— Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made.

— Conclude on the appropriateness of the Board of Directors' 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 our auditor's report to the related disclosures in the consolidated financial statements or, if such disclosures are inadequate, to modify our opinion. 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 continue as a going concern.

KPMG

— Evaluate the overall presentation, structure and content of the consolidated financial statements, including the disclosures, and whether the consolidated financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

— Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the Group to express an opinion on the consolidated financial statements. We are responsible for the direction, supervision and performance of the Group audit. We remain solely responsible for our audit opinion.

We communicate with the Board of Directors or its relevant committee 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 the Board of Directors or its relevant committee with a statement that we have complied with relevant ethical requirements regarding independence, and communicate to them all relationships and other matters that may reasonably be thought to bear on our independence, and where applicable, related safeguards.

From the matters communicated with the Board of Directors or its relevant committee, 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 or when, in extremely rare circumstances, we determine that a matter should not be communicated in our report because the adverse consequences of doing so would reasonably be expected to outweigh the public interest benefits of such communication.

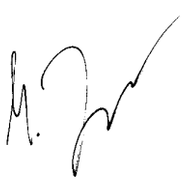
Report on Other Legal and Regulatory Requirements

In accordance with article 728a para. 1 item 3 CO and the Swiss Auditing Standard 890, we confirm that an internal control system exists, which has been designed for the preparation of consolidated financial statements according to the instructions of the Board of Directors.

We recommend that the consolidated financial statements submitted to you be approved.

KPMG AG

Mark Baillache
Licensed Audit Expert
Auditor in Charge



Marc Ziegler
Licensed Audit Expert

Basel, 28 January 2019

KPMG AG, Viaduktstrasse 42, PO Box 3456, CH-4002 Basel

KPMG

Independent Reasonable Assurance Report on Internal Control over Financial Reporting

To the Board of Directors of Roche Holding Ltd, Basel

We were engaged by the Board of Directors to carry out a reasonable assurance engagement on the design, implementation and operating effectiveness of the system of internal control over financial reporting of the Roche Group as it was in place at 31 December 2018. Management of Roche Holding Ltd assessed the effectiveness of its system of internal control over financial reporting as of 31 December 2018 based on the criteria for effective internal control over financial reporting described in *Internal Control – Integrated Framework 2013,* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

Responsibilities of the Board of Directors and Management

The Board of Directors and management of Roche Holding Ltd are responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting as included in the accompanying Report of Roche Management on Internal Control over Financial Reporting.

An entity's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial statements prepared in accordance with International Financial Reporting Standards (IFRS). An entity's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the entity; (2) provide reasonable assurance that transactions are recorded as necessary to permit the preparation of financial statements in accordance with the applicable financial reporting framework; and (3) provide reasonable assurance regarding the prevention or timely detection of the unauthorised acquisition, use, or disposition of the entity's assets that could have a material effect on the entity's financial statements.

Because of the inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Our Responsibilities

Our responsibility is to examine the design, implementation and effectiveness of the company's internal control over financial reporting and to report thereon in the form of an independent, reasonable assurance conclusion, based on the evidence obtained. We conducted our engagement in accordance with the International Standard on Assurance Engagements (ISAE) 3000 *Assurance Engagements Other Than Audits or Reviews of Historical Financial Information* issued by the International Auditing and Assurance Standards Board. That standard requires that we plan and perform our procedures to obtain reasonable assurance about whether effective internal control over financial reporting was maintained, in all material respects.

The procedures selected depend on our judgement, including the assessment of the risks of material misstatement of the design, implementation and effectiveness of the company's internal control over financial reporting. Our examination included obtaining an understanding of internal control over financial reporting, testing and evaluating the design, implementation and operating effectiveness of internal control based on the assessed risk, and performing such other procedures, as we considered necessary in the circumstances.

KPMG

Our Independence and Quality Control

The firm applies International Standard on Quality Control 1 and accordingly maintains a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

We have complied with the independence and other ethical requirements of the *Code of Ethics for Professional Accountants* issued by the International Ethics Standards Board for Accountants, which is founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behaviour.

Conclusion

Our conclusion has been formed on the basis of, and is subject to, the matters outlined in this report.

We believe that the evidence we have obtained is sufficient and appropriate to provide a basis for our conclusion.

In our opinion, the Roche Group maintained, in all material respects, effective internal control over financial reporting as of 31 December 2018 based on criteria established in *Internal Control – Integrated Framework 2013* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

We also have audited, in accordance with Swiss Auditing Standards and International Standards on Auditing, the consolidated financial statements of Roche Holding Ltd for the year ended 31 December 2018 and our report dated 28 January 2019 expressed an unqualified opinion on those consolidated financial statements.

KPMG AG

Mark Baillache
Licensed Audit Expert

Marc Ziegler
Licensed Audit Expert

Basel, 28 January 2019

KPMG AG, Viaduktstrasse 42, PO Box 3456, CH-4002 Basel

Multi-Year Overview and Supplementary Information

Multi-Year Overview

Statistics, as reported

	2009	2010	2011
Income statement in millions of CHF			
Sales	49,051	47,473	42,531
EBITDA	18,028	18,517	16,933
Operating profit	12,277	13,486	13,454
Net income attributable to Roche shareholders	7,784	8,666	9,343
Research and development	9,874	10,026	8,326
Balance sheet in millions of CHF			
Non-current assets	36,086	33,408	33,344
Current assets	38,479	27,612	28,232
Total assets	74,565	61,020	61,576
Non-current liabilities	(43,084)	(34,380)	(30,884)
Current liabilities	(22,067)	(14,978)	(16,210)
Total liabilities	(65,151)	(49,358)	(47,094)
Net assets	9,414	11,662	14,482
Capital and reserves attributable to Roche shareholders	7,366	9,469	12,095
Equity attributable to non-controlling interests	2,048	2,193	2,387
Additions to property, plant and equipment	2,837	2,633	2,006
Personnel			
Number of employees at end of year	81,507	80,653	80,129
Key ratios			
Net income attributable to Roche shareholders as % of sales	16	18	22
Net income attributable to Roche shareholders as % of equity	106	92	77
Research and development as % of sales	20	21	20
Current ratio %	174	184	174
Equity and non-controlling interests as % of total assets	13	19	24
Human capital return on investment ratio	2.02	2.13	2.31
Data on shares and non-voting equity securities			
Number of shares	160,000,000	160,000,000	160,000,000
Number of non-voting equity securities *(Genussscheine)*	702,562,700	702,562,700	702,562,700
Total shares and non-voting equity securities	862,562,700	862,562,700	862,562,700
Total dividend in millions of CHF	5,175	5,693	5,865
Earnings per share and non-voting equity security (diluted) in CHF	9.02	10.11	10.98
Dividend per share and non-voting equity security in CHF	6.00	6.60	6.80

Information in this table is stated as reported and changes in accounting policies arising from changes in International Financial Reporting Standards are not applied retrospectively.

2012	2013	2014	2015	2016	2017	2018
45,499	46,780	47,462	48,145	50,576	53,299	56,846
19,040	19,802	19,558	19,479	20,483	21,201	22,825
14,125	16,376	14,090	13,821	14,069	13,003	14,769
9,539	11,164	9,332	8,863	9,576	8,633	10,500
9,552	9,270	9,895	9,581	11,532	11,292	12,092
33,434	33,003	44,426	47,581	48,149	45,104	46,273
31,371	29,164	31,114	28,182	28,670	31,572	32,244
64,805	62,167	75,540	75,763	76,819	76,676	78,517
(27,868)	(25,166)	(30,874)	(28,695)	(27,817)	(25,509)	(25,118)
(20,209)	(15,760)	(23,108)	(23,768)	(22,600)	(22,160)	(23,033)
(48,077)	(40,926)	(53,982)	(52,463)	(50,417)	(47,669)	(48,151)
16,728	21,241	21,558	23,300	26,402	29,007	30,366
14,494	19,294	19,586	20,979	23,911	26,441	27,622
2,234	1,947	1,972	2,321	2,491	2,566	2,744
2,130	2,458	2,905	4,077	3,790	3,477	3,796
82,089	85,080	88,509	91,747	94,052	93,734	94,442
21	24	20	18	19	16	19
66	58	48	42	40	33	38
21	20	21	20	23	21	21
155	185	135	119	127	142	140
26	34	29	31	34	38	39
2.25	2.45	2.16	2.06	2.06	1.89	1.96
160,000,000	160,000,000	160,000,000	160,000,000	160,000,000	160,000,000	160,000,000
702,562,700	702,562,700	702,562,700	702,562,700	702,562,700	702,562,700	702,562,700
862,562,700	862,562,700	862,562,700	862,562,700	862,562,700	862,562,700	862,562,700
6,340	6,728	6,901	6,987	7,073	7,159	7,504[a]
11.16	12.93	10.81	10.28	11.13	10.04	12.21
7.35	7.80	8.00	8.10	8.20	8.30	8.70[a]

a) 2018 dividend proposed by the Board of Directors.

Sales by division in millions of CHF

	2014	2015	2016	2017	2018
Pharmaceuticals	36,696	37,331	39,103	41,220	43,967
Diagnostics	10,766	10,814	11,473	12,079	12,879
Total	**47,462**	**48,145**	**50,576**	**53,299**	**56,846**

Sales by geographical area in millions of CHF

	2014	2015	2016	2017	2018
Switzerland	526	497	577	574	627
Germany	2,900	2,734	3,004	3,041	3,147
Rest of Europe	11,119	10,046	10,264	10,135	9,828
Europe	**14,545**	**13,277**	**13,845**	**13,750**	**13,602**
United States	18,041	20,164	21,192	23,122	26,105
Rest of North America	962	855	851	897	931
North America	**19,003**	**21,019**	**22,043**	**24,019**	**27,036**
Latin America	3,285	2,832	2,681	3,024	2,870
Japan	3,755	3,648	4,211	4,214	4,175
Rest of Asia	5,327	6,006	6,461	6,824	7,689
Asia	**9,082**	**9,654**	**10,672**	**11,038**	**11,864**
Africa, Australia and Oceania	1,547	1,363	1,335	1,468	1,474
Total	**47,462**	**48,145**	**50,576**	**53,299**	**56,846**

Additions to property, plant and equipment by division in millions of CHF

	2014	2015	2016	2017	2018
Pharmaceuticals	1,674	2,706	2,154	2,030	2,340
Diagnostics	1,228	1,363	1,629	1,443	1,376
Corporate	3	8	7	4	80
Total	**2,905**	**4,077**	**3,790**	**3,477**	**3,796**

Additions to property, plant and equipment by geographical area in millions of CHF

	2014	2015	2016	2017	2018
Switzerland	691	964	892	846	858
Germany	527	602	759	541	543
Rest of Europe	335	349	315	322	329
Europe	**1,553**	**1,915**	**1,966**	**1,709**	**1,730**
United States	683	1,382	1,060	844	900
Rest of North America	6	4	7	7	4
North America	**689**	**1,386**	**1,067**	**851**	**904**
Latin America	113	132	133	110	113
Japan	154	230	192	331	647
Rest of Asia	371	379	387	422	371
Asia	**525**	**609**	**579**	**753**	**1,018**
Africa, Australia and Oceania	25	35	45	54	31
Total	**2,905**	**4,077**	**3,790**	**3,477**	**3,796**

Alternative Performance Measures

The financial information included in the Financial Review includes certain Alternative Performance Measures (APMs) which are not accounting measures as defined by IFRS, in particular the core results, net working capital, net operating assets, free cash flow and constant exchange rates. These APMs should not be used instead of, or considered as alternatives to, the Group's consolidated financial results based on IFRS. These APMs may not be comparable to similarly titled measures disclosed by other companies. All APMs presented in the Financial Review relate to the performance of the current year and comparative periods.

Core results

Core results allow for an assessment of both the Group's actual results as defined by IFRS and the underlying performance of the business. The core results concept, which is used in the internal management of the business, is based on the IFRS results, with the following adjustments:

- Global restructuring plans (see Note 7) are excluded.
- Amortisation and impairment of intangible assets (see Note 10) and impairment of goodwill (see Note 9) are excluded.
- Acquisition accounting and other impacts from the accounting for merger and acquisition transactions and alliance arrangements (see Financial Review) are excluded.
- Discontinued operations (currently none) are excluded.
- Legal and environmental cases (see Financial Review) are excluded.
- Global issues outside the healthcare sector beyond the Group's control are excluded.
- Material treasury items such as major debt restructurings (currently none) are excluded.
- Pension plan settlements (see Note 26) are excluded.
- The tax benefit recorded under IFRS in respect of Equity Compensation Plans (ECPs), which varies according to the price of the underlying equity, is replaced by a normalised tax benefit, being the IFRS 2 expense multiplied by the applicable tax rate (see Note 5).

The core results concept was further described on 22 October 2010 at an Investor Update teleconference, which is available for download at: http://www.roche.com/investors/ir_agenda/csr_151010.htm

The Group's IFRS results, including the divisional breakdown, are reconciled to the core results in the tables below. The calculation of Core EPS is also given in the tables below. Additional commentary to the adjustment items is given in the Financial Review.

Core results reconciliation – 2018 in millions of CHF

	IFRS	Global restructuring	Intangibles amortisation	Intangibles impairment	M&A and alliance transactions	Legal & environmental	Pension plan settlements	Global issues	Normalisation of ECP tax benefit	Core
Sales	56,846	–	–	–	–	–	–	–	–	56,846
Royalties and other operating income	2,651	(16)	–	–	–	–	–	–	–	2,635
Cost of sales	(17,269)	400	1,111	294	–	–	0	–	–	(15,464)
Marketing and distribution	(10,109)	168	36	–	–	–	0	–	–	(9,905)
Research and development	(12,092)	110	147	788	–	–	0	–	–	(11,047)
General and administration	(5,258)	245	–	2,254	35	159	5	–	–	(2,560)
Operating profit	**14,769**	**907**	**1,294**	**3,336**	**35**	**159**	**5**	**–**	**–**	**20,505**
Financing costs	(770)	2	–	–	15	9	–	–	–	(744)
Other financial income (expense)	149	–	–	–	–	–	–	–	–	149
Profit before taxes	**14,148**	**909**	**1,294**	**3,336**	**50**	**168**	**5**	**–**	**–**	**19,910**
Income taxes	(3,283)	(150)	(184)	(229)	(29)	(37)	(1)	(35)	19	(3,929)
Net income	**10,865**	**759**	**1,110**	**3,107**	**21**	**131**	**4**	**(35)**	**19**	**15,981**
Attributable to										
– Roche shareholders	10,500	759	1,097	3,097	21	131	4	(35)	19	15,593
– Non-controlling interests	365	–	13	10	–	–	–	–	–	388

Core results reconciliation – 2017 in millions of CHF

	IFRS	Global restructuring	Intangibles amortisation	Intangibles impairment	M&A and alliance transactions	Legal & environmental	Pension plan settlements	Global issues	Normalisation of ECP tax benefit	Core
Sales	53,299	–	–	–	–	–	–	–	–	53,299
Royalties and other operating income	2,447	0	–	–	–	–	–	–	–	2,447
Cost of sales	(18,179)	484	1,545	1,784	–	–	0	–	–	(14,366)
Marketing and distribution	(9,847)	326	9	0	–	–	0	–	–	(9,512)
Research and development	(11,292)	87	137	676	–	–	0	–	–	(10,392)
General and administration	(3,425)	311	–	1,058	(350)	(80)	22	–	–	(2,464)
Operating profit	**13,003**	**1,208**	**1,691**	**3,518**	**(350)**	**(80)**	**22**	**–**	**–**	**19,012**
Financing costs	(839)	2	–	–	14	4	–	–	–	(819)
Other financial income (expense)	84	–	–	–	(9)	–	–	–	–	75
Profit before taxes	**12,248**	**1,210**	**1,691**	**3,518**	**(345)**	**(76)**	**22**	**–**	**–**	**18,268**
Income taxes	(3,423)	(248)	(513)	(867)	(2)	46	(4)	116	31	(4,864)
Net income	**8,825**	**962**	**1,178**	**2,651**	**(347)**	**(30)**	**18**	**116**	**31**	**13,404**
Attributable to										
– Roche shareholders	8,633	962	1,162	2,645	(347)	(28)	18	116	31	13,192
– Non-controlling interests	192	–	16	6	–	(2)	–	–	–	212

Divisional core results reconciliation – 2018 in millions of CHF

	IFRS	Global restruc-turing	Intangibles amorti-sation	Intangibles impairment	M&A and alliance trans-actions	Legal & environ-mental	Pension plan settlements	Core
Pharmaceuticals								
Sales	43,967	–	–	–	–	–	–	43,967
Royalties and other operating income	2,553	–	–	–	–	–	–	2,553
Cost of sales	(10,491)	292	969	(274)	–	–	0	(9,504)
Marketing and distribution	(7,068)	97	32	0	–	–	0	(6,939)
Research and development	(10,299)	76	130	507	–	–	0	(9,586)
General and administration	(3,874)	58	–	2,147	91	24	5	(1,549)
Operating profit	**14,788**	**523**	**1,131**	**2,380**	**91**	**24**	**5**	**18,942**
Diagnostics								
Sales	12,879	–	–	–	–	–	–	12,879
Royalties and other operating income	98	(16)	–	–	–	–	–	82
Cost of sales	(6,778)	108	142	568	–	–	0	(5,960)
Marketing and distribution	(3,041)	71	4	0	–	–	0	(2,966)
Research and development	(1,793)	34	17	281	–	–	0	(1,461)
General and administration	(748)	38	–	107	(56)	131	0	(528)
Operating profit	**617**	**235**	**163**	**956**	**(56)**	**131**	**0**	**2,046**
Corporate								
General and administration	(636)	149	–	–	0	4	0	(483)
Operating profit	**(636)**	**149**	**–**	**–**	**0**	**4**	**0**	**(483)**

Divisional core results reconciliation – 2017 in millions of CHF

	IFRS	Global restruc-turing	Intangibles amorti-sation	Intangibles impairment	M&A and alliance trans-actions	Legal & environ-mental	Pension plan settlements	Core
Pharmaceuticals								
Sales	41,220	–	–	–	–	–	–	41,220
Royalties and other operating income	2,284	0	–	–	–	–	0	2,284
Cost of sales	(11,978)	377	1,230	1,664	–	–	0	(8,707)
Marketing and distribution	(6,960)	234	6	0	–	–	0	(6,720)
Research and development	(9,704)	21	123	524	–	–	0	(9,036)
General and administration	(1,620)	245	–	384	(324)	(143)	18	(1,440)
Operating profit	**13,242**	**877**	**1,359**	**2,572**	**(324)**	**(143)**	**18**	**17,601**
Diagnostics								
Sales	12,079	–	–	–	–	–	–	12,079
Royalties and other operating income	163	0	–	–	–	–	–	163
Cost of sales	(6,201)	107	315	120	–	–	0	(5,659)
Marketing and distribution	(2,887)	92	3	0	–	–	0	(2,792)
Research and development	(1,588)	66	14	152	–	–	0	(1,356)
General and administration	(1,262)	27	–	674	(27)	58	4	(526)
Operating profit	**304**	**292**	**332**	**946**	**(27)**	**58**	**4**	**1,909**
Corporate								
General and administration	(543)	39	–	–	1	5	0	(498)
Operating profit	**(543)**	**39**	**–**	**–**	**1**	**5**	**0**	**(498)**

Core EPS (basic)

	2018	2017
Core net income attributable to Roche shareholders (CHF millions)	15,593	13,192
Weighted average number of shares and non-voting equity securities in issue (millions) [27]	854	853
Core earnings per share (basic) (CHF)	**18.25**	**15.47**

Core EPS (diluted)

	2018	2017
Core net income attributable to Roche shareholders (CHF millions)	15,593	13,192
Increase in non-controlling interests' share of core net income, assuming all outstanding Chugai stock options exercised (CHF millions)	(1)	(1)
Net income used to calculate diluted earnings per share (CHF millions)	**15,592**	**13,191**
Weighted average number of shares and non-voting equity securities in issue used to calculate diluted earnings per share (millions) [27]	**860**	**860**
Core earnings per share (diluted) (CHF)	**18.14**	**15.34**

Free cash flow

Free cash flow is used to assess the Group's ability to generate the cash required to conduct and maintain its operations. It also indicates the Group's ability to generate cash to finance dividend payments, repay debt and to undertake merger and acquisition activities. The free cash flow concept is used in the internal management of the business.

Operating free cash flow is calculated based on the IFRS operating profit and adjusted for certain cash items, movements in net working capital and capital expenditures (investments in property, plant and equipment and intangible assets). Operating free cash flow is different from cash flows from operating activities as defined by IAS 7 in that it includes capital expenditures (which is within the responsibility of divisional management) and excludes income taxes paid (which is not within the responsibility of divisional management). Cash outflows from defined benefit plans are allocated to the operating free cash flow based on the current service cost with the residual allocated to treasury activities.

Free cash flow is calculated as the operating free cash flow adjusted for treasury activities and taxes paid. Free cash flow is different from total cash flows as defined by IAS 7 in that it excludes dividend payments, cash inflows/outflows from financing activities such as issuance/repayment of debt, purchase/sale of marketable securities and cash inflows/outflows from mergers, acquisitions and divestments.

Operating free cash flow and free cash flow are calculated as shown in the tables below. Additional commentary to the adjustment items is given in the Financial Review.

Operating free cash flow reconciliation in millions of CHF

	2018	2017
Cash flows from operating activities (IFRS basis in accordance with IAS 7)	**19,979**	**18,024**
Add back		
– Income taxes paid	3,288	3,909
Deduct		
– Investments in property, plant and equipment	(4,043)	(3,509)
– Investments in intangible assets	(879)	(704)
– Disposal of property, plant and equipment	146	100
– Disposal of intangible assets	0	0
Pensions and other post-employment benefits		
– Add back total payments for defined benefit plans	785	538
– Deduct allocation of payments to operating free cash flow	(582)	(532)
Other operating items	47	1
Operating free cash flow	**18,741**	**17,827**

Free cash flow reconciliation in millions of CHF

	2018	2017
Cash flows from operating activities (IFRS basis in accordance with IAS 7)	**19,979**	**18,024**
Deduct		
– Investments in property, plant and equipment	(4,043)	(3,509)
– Investments in intangible assets	(879)	(704)
– Disposal of property, plant and equipment	146	100
– Disposal of intangible assets	0	0
– Interest paid	(593)	(648)
Other operating items	47	1
Other treasury items	154	156
Free cash flow	**14,811**	**13,420**

Supplementary information used to calculate the divisional operating free cash flow is shown in the table below.

Divisional operating free cash flow information in millions of CHF

	Pharmaceuticals		Diagnostics		Corporate		Group	
	2018	2017	2018	2017	2018	2017	2018	2017
Depreciation, amortisation and impairment								
Depreciation of property, plant and equipment	1,129	1,165	1,097	1,024	66	7	2,292	2,196
Amortisation of intangible assets	1,131	1,359	163	332	–	–	1,294	1,691
Impairment of property, plant and equipment	137	184	1	37	3	12	141	233
Impairment of goodwill	2,147	384	107	674	–	–	2,254	1,058
Impairment of intangible assets	233	2,188	849	272	–	–	1,082	2,460
Total	**4,777**	**5,280**	**2,217**	**2,339**	**69**	**19**	**7,063**	**7,638**
Other adjustments								
Add back								
– Expenses for equity-settled equity compensation plans	392	388	78	73	38	34	508	495
– Net (income) expense for provisions	750	102	269	152	85	16	1,104	270
– Net (gain) loss from disposals	(336)	(308)	14	9	0	0	(322)	(299)
– Non-cash working capital and other items	583	473	160	145	(11)	(1)	732	617
Deduct								
– Utilisation of provisions	(637)	(405)	(153)	(140)	(58)	(76)	(848)	(621)
– Proceeds from disposals	377	460	107	50	(3)	–	481	510
Total	**1,129**	**710**	**475**	**289**	**51**	**(27)**	**1,655**	**972**
Operating profit cash adjustments	**5,906**	**5,990**	**2,692**	**2,628**	**120**	**(8)**	**8,718**	**8,610**

EBITDA

The Group does not use Earnings Before Interest, Tax, Depreciation and Amortisation (EBITDA) in either its internal management reporting or its external communications. In the opinion of the Group's management, operating free cash flow gives a more useful and consistent measurement of 'cash earnings' than EBITDA, which includes many non-cash items such as provisions, allowances for trade receivables and inventories, and certain non-cash entries arising from acquisition accounting and pension accounting.

For the convenience of those readers that do use EBITDA, this is provided in the table below. As the starting point this uses the core results, which already exclude the amortisation and impairment of goodwill and intangible assets.

EBITDA (using core results) in millions of CHF

	Pharmaceuticals		Diagnostics		Corporate		Group	
	2018	2017	2018	2017	2018	2017	2018	2017
EBITDA								
Core operating profit	18,942	17,601	2,046	1,909	(483)	(498)	20,505	19,012
Depreciation and impairment of property, plant and equipment – Core basis	1,159	1,145	1,092	1,025	69	19	2,320	2,189
EBITDA	**20,101**	**18,746**	**3,138**	**2,934**	**(414)**	**(479)**	**22,825**	**21,201**
– margin, % of sales	45.7	45.5	24.4	24.3	–	–	40.2	39.8

Net operating assets

Net operating assets allow for an assessment of the Group's operating performance of the business independently from financing and tax activities. Net operating assets are calculated as property, plant and equipment, goodwill, intangible assets, net working capital and long-term net operating assets minus provisions.

The calculation of the net operating assets disclosed in Note 2 of the Annual Financial Statements is shown in the tables below.

Net operating assets reconciliation – 2018 in millions of CHF

	Pharmaceuticals	Diagnostics	Corporate	Taxation and Treasury	Group
Property, plant and equipment	15,123	6,413	282	–	21,818
Goodwill	3,883	5,065	–	–	8,948
Intangible assets	8,297	1,049	–	–	9,346
Inventories	4,284	2,336	1	–	6,621
Provisions	(2,508)	(948)	(325)	–	(3,781)
Current income tax net liabilities	–	–	–	(3,600)	(3,600)
Deferred tax net assets	–	–	–	3,511	3,511
Defined benefit plan net liabilities	–	–	–	(6,140)	(6,140)
Marketable securities	–	–	–	6,437	6,437
Cash and cash equivalents	–	–	–	6,681	6,681
Debt	–	–	–	(18,770)	(18,770)
Other net assets (liabilities)					
– Net working capital	(1,812)	361	(215)	–	(1,666)
– Long-term net operating assets	420	46	(1)	–	465
– Other	–	–	–	496	496
Total net assets	**27,687**	**14,322**	**(258)**	**(11,385)**	**30,366**

Net operating assets reconciliation – 2017 in millions of CHF

	Pharmaceuticals	Diagnostics	Corporate	Taxation and Treasury	Group
Property, plant and equipment	14,358	6,431	123	–	20,912
Goodwill	4,870	5,207	–	–	10,077
Intangible assets	6,326	2,042	–	–	8,368
Inventories	5,126	2,280	1	–	7,407
Provisions	(2,449)	(842)	(299)	–	(3,590)
Current income tax net liabilities	–	–	–	(3,060)	(3,060)
Deferred tax net assets	–	–	–	3,081	3,081
Defined benefit plan net liabilities	–	–	–	(6,620)	(6,620)
Marketable securities	–	–	–	7,278	7,278
Cash and cash equivalents	–	–	–	4,719	4,719
Debt	–	–	–	(18,960)	(18,960)
Other net assets (liabilities)					
– Net working capital	(1,706)	314	(120)	–	(1,512)
– Long-term net operating assets	434	11	(2)	–	443
– Other	–	–	–	464	464
Total net assets	**26,959**	**15,443**	**(297)**	**(13,098)**	**29,007**

Net debt

Net debt is used to monitor the Group's overall short- and long-term liquidity. Net debt is calculated as the sum of total debt (long-term and short-term) less marketable securities, cash and cash equivalents.

Net debt calculations, including details of movements during the current year, are shown in the table on page 33 in the Financial Review.

Net working capital

Net working capital is used to assess the Group's efficiency in utilising assets and short-term liquidity. Net trade working capital is calculated as trade receivables and inventories minus trade payables. Net working capital is calculated as net trade working capital adjusted for other receivables and other payables.

Net working capital and net trade working capital calculations are shown in the tables on page 20 (Pharmaceuticals Division), page 26 (Diagnostics Division) and page 28 (Corporate) in the Financial Review.

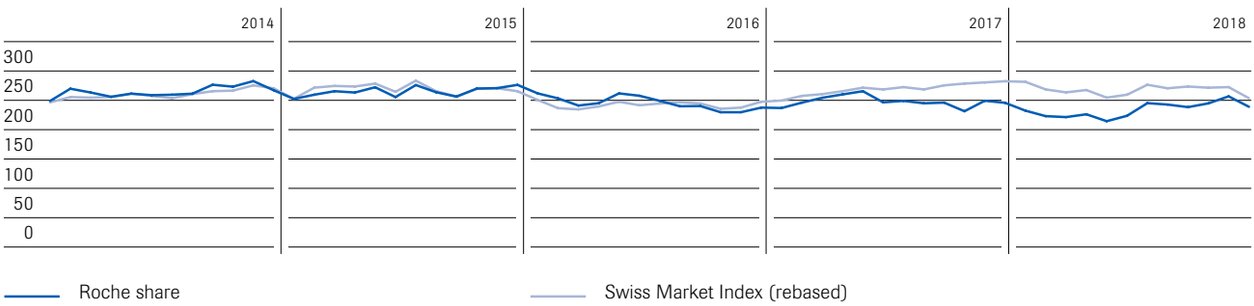
Constant exchange rates

Certain percentage changes in the Financial Review have been calculated using constant exchange rates (CER) which allow for an assessment of the Group's financial performance with the effects of exchange rate fluctuations eliminated. The percentage changes at constant exchange rates are calculated using simulations by reconsolidating both the current reported period and the prior period numbers at constant currency exchange rates, equalling the average exchange rates for the prior year. For example, a CER change between a 2018 line item and its 2017 equivalent is calculated using the average exchange rate for the year ended 31 December 2017 for both the 2018 line item and the 2017 line item and subsequently calculating the change in percent with respect to the two recalculated numbers.

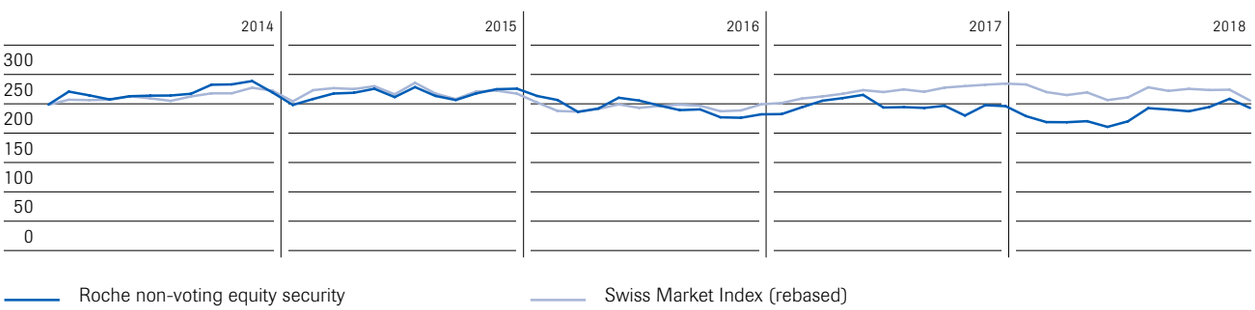
Foreign exchange gains and losses are excluded from the calculation of CER growth rates in the earnings per share disclosures. In countries where there is a significant devaluation in the local currency in the current year, the simulations use the average exchange rate of the current year instead of the prior year to avoid that CER growth rates are artificially inflated.

Roche Securities

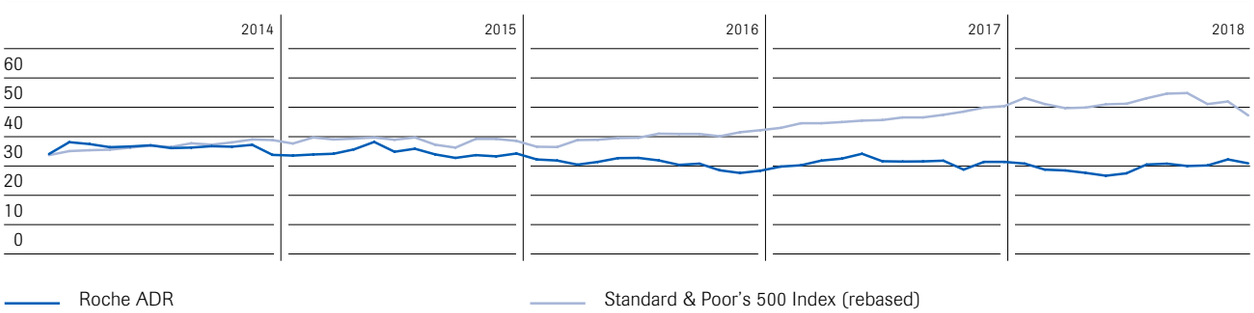
Price development of share in CHF



Price development of non-voting equity security *(Genussschein)* in CHF



Price development of American Depositary Receipt (ADR) in USD



Eight Roche American Depositary Receipts (ADRs) are equivalent to one non-voting equity security *(Genussschein)*. ADRs have been traded in the US over-the-counter market since July 1992.
Information in these tables is restated for the change in the ratio for the ADRs from 1:1 to 2:1 effective 24 January 2005, the change in the ratio for the ADRs from 2:1 to 4:1 effective 9 January 2009 and the change in the ratio for the ADRs from 4:1 to 8:1 effective 27 February 2014.

Number of shares and non-voting equity securities[a]

	2014	2015	2016	2017	2018
Number of shares (nominal value: CHF 1.00)	160,000,000	160,000,000	160,000,000	160,000,000	160,000,000
Number of non-voting equity securities *(Genussscheine)* (no nominal value)	702,562,700	702,562,700	702,562,700	702,562,700	702,562,700
Total	**862,562,700**	**862,562,700**	**862,562,700**	**862,562,700**	**862,562,700**
Number of own shares and non-voting equity securities *(Genussscheine)* held	(12,819,364)	(10,542,434)	(10,635,070)	(8,712,977)	(8,134,699)
Total in issue	**849,743,336**	**852,020,266**	**851,927,630**	**853,849,723**	**854,428,001**

Data per share and non-voting equity security in CHF

		2014	2015	2016	2017	2018
Earnings (basic)		10.99	10.42	11.24	10.12	12.29
Earnings (diluted)		10.81	10.28	11.13	10.04	12.21
Core earnings (basic)		14.53	13.66	14.68	15.47	18.25
Core earnings (diluted)		14.29	13.49	14.53	15.34	18.14
Equity attributable to Roche shareholders		23.05	24.62	28.07	30.97	32.33
Dividend		8.00	8.10	8.20	8.30	8.70[c]
Stock price of share[b]	Opening	247.40	267.75	276.75	238.00	246.20
	High	289.00	284.50	276.75	271.75	258.00
	Low	239.40	244.40	223.50	230.40	211.60
	Year-end	267.75	276.75	238.00	246.20	239.40
Stock price of non-voting equity security *(Genussschein)*[b]	Opening	249.20	269.90	276.40	232.60	246.50
	High	294.60	286.20	276.40	272.60	259.50
	Low	239.00	241.70	220.10	227.70	207.70
	Year-end	269.90	276.40	232.60	246.50	243.40

Market capitalisation in millions of CHF

	2014	2015	2016	2017	2018
Year-end	229,003	235,554	199,022	210,426	207,328

Key ratios (year-end)

	2014	2015	2016	2017	2018
Dividend yield of shares in %	3.0	2.9	3.4	3.4	3.6
Dividend yield of non-voting equity securities *(Genussscheine)* in %	3.0	2.9	3.5	3.4	3.6
Price/earnings of shares	25	27	21	25	20
Price/earnings of non-voting equity securities *(Genussscheine)*	25	27	21	25	20

a) Each non-voting equity security *(Genussschein)* confers the same rights as any of the shares to participate in the available earnings and any remaining proceeds from liquidation following repayment of the nominal value of the shares and the participation certificate capital (if any). Shares and non-voting equity securities are listed on the SIX Swiss Exchange. Roche Holding Ltd has no restrictions as to ownership of its shares or non-voting equity securities.
b) All stock price data reflect daily closing prices.
c) 2018 dividend proposed by the Board of Directors.

Stock codes

	Share	Non-voting equity security	American Depositary Receipt (ADR)
SIX Swiss Exchange	RO	ROG	–
Bloomberg	RO SW	ROG VX	RHHBY US
Reuters	RO.S	ROG.VX	RHHBY.PK

Roche Holding Ltd, Basel

Financial Statements

Balance sheet in millions of CHF

	31 December 2018	31 December 2017
Current assets		
Cash and cash equivalents	1,754	843
Marketable securities	930	1,440
Accounts receivable from Group companies	4,859	5,104
Short-term loans to Group companies	1,000	1,200
Total current assets	**8,543**	**8,587**
Non-current assets		
Long-term loans to Group companies	618	612
Investments	8,869	8,852
Total non-current assets	**9,487**	**9,464**
Total assets	**18,030**	**18,051**
Short-term liabilities		
Accounts payable to Group companies	6	10
Interest-bearing liabilities to Group companies	789	1,301
Other short-term liabilities	16	15
Total short-term liabilities	**811**	**1,326**
Long-term liabilities		
Provisions	35	35
Total long-term liabilities	**35**	**35**
Total liabilities	**846**	**1,361**
Shareholders' equity		
Share capital	160	160
Non-voting equity securities *(Genussscheine)*	p.m.	p.m.
Legal retained earnings:		
– General legal retained earnings	300	300
Voluntary reserves and retained earnings:		
– Free reserve	6,000	6,000
– Special reserve	2,152	2,152
– Available earnings		
– Balance brought forward from previous year	919	878
– Net income for the year	7,653	7,200
Total shareholders' equity	**17,184**	**16,690**
Total shareholders' equity and liabilities	**18,030**	**18,051**

p.m. = pro memoria. Non-voting equity securities *(Genussscheine)* have no nominal value.

Income statement in millions of CHF

	Year ended 31 December	
	2018	2017
Income		
Income from investments (dividend income)	7,614	7,189
Other financial income		
– Interest income from loans to Group companies	31	31
– Income from marketable securities and other	7	2
Guarantee fee income from Group companies	77	87
Other income	36	38
Total income	**7,765**	**7,347**
Expenses		
Administration expenses	(35)	(39)
Other expenses	(45)	(48)
Financial expenses	(16)	(52)
Direct taxes	(16)	(8)
Total expenses	**(112)**	**(147)**
Net income	**7,653**	**7,200**

Notes to the Financial Statements

1. Summary of significant accounting policies

Basis of preparation

The financial statements of Roche Holding Ltd, Basel (the 'Company') have been prepared in accordance with the provisions of Swiss Law on Accounting and Financial Reporting (32nd title of the Swiss Code of Obligations, 'CO'). Where not prescribed by law, the significant accounting principles applied are described below.

The Company has prepared its consolidated financial statements in accordance with a recognised accounting standard (International Financial Reporting Standards). In accordance with the CO, the Company decided to forgo presenting additional information on audit fees in the notes as well as a cash flow statement.

Valuation methods and translation of foreign currencies

Marketable securities are reported at the lower of cost or market value. All other financial assets, including investments, are reported at cost less appropriate write-downs. Own equity instruments are recognised at cost and deducted from equity at the time of purchase. If the own equity instruments are sold, the gain or loss is recognised through the income statement. Assets and liabilities denominated in foreign currencies are translated into Swiss francs using year-end rates of exchange, except investments which are translated at historical rates. Transactions during the year which are denominated in foreign currencies are translated at the exchange rates effective at the relevant transaction dates. Resulting exchange gains and losses are recognised in the income statement with the exception of unrealised gains which are deferred.

Investments

The direct and indirect investments of the Company are listed in Note 32 to the Roche Group Annual Financial Statements. This listing excludes Chugai's subsidiaries as well as not material companies, notably companies that are inactive, dormant or in liquidation. Ownership interests equal voting rights.

Taxes

Direct taxes include corporate income and capital taxes.

2. Shareholders' equity

Share capital

As in the previous year, share capital amounts to CHF 160 million. The share capital consists of 160,000,000 bearer shares with a nominal value of CHF 1.00 each. Included in equity are 702,562,700 non-voting equity securities *(Genussscheine).* They are not part of the share capital and confer no voting rights. However, each non-voting equity security confers the same rights as any of the shares to participate in the available earnings and in any remaining proceeds from liquidation following repayment of the nominal value of the share capital and, if any, participation certificates.

Own equity instruments

At 31 December 2018 the Company did not hold any Roche shares or non-voting equity securities (2017: none). During 2018 and 2017 the Company neither purchased nor sold Roche shares or non-voting equity securities.

Company's subsidiaries that meet the definitions and requirements of Article 659b CO do not hold equity instruments. Within the Roche Group Annual Financial Statements some entities (mainly foundations) are included in the consolidation which do not qualify as subsidiaries under Article 659b CO.

Movement in recognised amounts in millions of CHF

			Voluntary reserves and retained earnings				
	Share capital	Legal retained earnings	Free reserve	Special reserve	Available earnings	Own equity instruments	Total equity
As at 1 January 2016	160	300	6,000	2,152	7,870	(15)	16,467
Net income	–	–	–	–	7,067	–	7,067
Dividends	–	–	–	–	(6,986)	–	(6,986)
Transactions in own equity instruments	–	–	–	–	–	15	15
As at 31 December 2016	**160**	**300**	**6,000**	**2,152**	**7,951**	**0**	**16,563**
Net income	–	–	–	–	7,200	–	7,200
Dividends	–	–	–	–	(7,073)	–	(7,073)
Transactions in own equity instruments	–	–	–	–	–	0	0
As at 31 December 2017	**160**	**300**	**6,000**	**2,152**	**8,078**	**0**	**16,690**
Net income	–	–	–	–	7,653	–	7,653
Dividends	–	–	–	–	(7,159)	–	(7,159)
Transactions in own equity instruments	–	–	–	–	–	0	0
As at 31 December 2018	**160**	**300**	**6,000**	**2,152**	**8,572**	**0**	**17,184**

3. Contingent liabilities

Guarantees

The Company has issued guarantees for certain bonds and notes, commercial paper and credit facilities of Group companies. The nominal amount outstanding at 31 December 2018 was CHF 18.4 billion (2017: CHF 18.6 billion). These are described in Note 21 to the Roche Group Annual Financial Statements.

4. Significant shareholders

All shares in the Company are bearer shares, and for this reason the Company does not keep a register of shareholders. The following figures are based on information from shareholders, the shareholder validation check at the Annual General Meeting of 13 March 2018 and on other information available to the Company.

Controlling shareholders

At 31 December 2018 and 2017, based on information supplied to the Group, a shareholder group with pooled voting rights owned 72,018,000 shares, which represented 45.01% of the issued shares. This group consisted of Ms Vera Michalski-Hoffmann, Ms Maja Hoffmann, Mr André Hoffmann, Dr Andreas Oeri, Ms Sabine Duschmalé-Oeri, Ms Catherine Oeri, Dr Jörg Duschmalé, Mr Lukas Duschmalé and the charitable foundation Wolf. The shareholder pooling agreement has existed since 1948. The figures above do not include any shares without pooled voting rights that are held outside this group by individual members of the group. Ms Maja Oeri, formerly a member of the pool, now holds 8,091,900 shares representing 5.057% of the voting rights independently of the pool.

At 31 December 2018, based on information supplied to the Group, 53,332,863 shares (2017: 53,332,863 shares) are owned by Novartis Holding AG, Basel (participation below 33⅓%).

5. Full-time equivalent employees

The annual average number of full-time equivalent employees for 2018 and 2017 did not exceed ten people.

6. Board and Executive shareholdings

Board of Directors

Directors Mr André Hoffmann and Dr Andreas Oeri and certain other members of the founder's families who are closely associated with them belong to a shareholder group with pooled voting rights. At the end of 2018 and 2017 this group held 72,018,000 shares (45.01% of issued shares). Detailed information about this group is given in Note 4. In addition, at the end of the year the members of the Board of Directors and persons closely associated with them held shares and non-voting equity securities *(Genussscheine)* as shown in the table below.

Shareholdings of members of the Board of Directors

	Shares		Non-voting equity securities *(Genussscheine)*		
	2018	2017	2018	2017	Other
Ch. Franz	16,014	11,522	4,810	4,810	
A. Hoffmann	0[a]	0[a]	200	200	
J. Bell	1,115	1,115	1,647	1,647	
J. Brown	729	729	0	0	
P. Bulcke	0	0	4,000	4,000	
A. Hauser	0	0	150	150	[d]
R.P. Lifton	0	0	0	0	[e]
A. Oeri	0[a]	0[a]	187,793	187,793	
B. Poussot	500	500	500	500	
S. Schwan	–	–	–	–	[b]
C. Suessmuth Dyckerhoff	0	0	2,100[c]	621[c]	
P.R. Voser	0	0	5,000	5,000	
Total	**18,358**	**13,866**	**206,200**	**204,721**	

a) Does not include shares held in the shareholder group with pooled voting rights.
b) As a member of the Corporate Executive Committee, Dr Schwan's shareholdings are disclosed in the tables below.
c) Jointly held with close relative.
d) Close relatives of A. Hauser held 20 non-voting equity securities *(Genussscheine)* (2017: 20).
e) R.P. Lifton held 300 Roche American Depositary Receipts (ADRs) (2017: 300). Eight ADRs are equivalent to one non-voting equity security *(Genussschein).* ADRs have been traded in the US over-the-counter market since July 1992.

Corporate Executive Committee

At the end of the year members of the Corporate Executive Committee and persons closely associated with them held shares and non-voting equity securities as shown in the table below.

Shareholdings of members of the Corporate Executive Committee

	Shares		Non-voting equity securities *(Genussscheine)*		Other
	2018	2017	2018	2017	
S. Schwan	175,890	153,428	35,270	27,040	a)
R. Diggelmann	n/a	0	n/a	8,058	a)
M. Heuer	3	n/a	18,602	n/a	a), c), d)
A. Hippe	6,970	6,970	19,956	16,585	a)
G.A. Keller	19,191	19,191	21,462	18,445	a), b)
D. O'Day	3,065	3,065	19,432	16,091	a)
C.A. Wilbur	0	0	3,955	3,141	a)
Total	**205,119**	**182,654**	**118,677**	**89,360**	

a) Equity compensation awards: S-SARs, RSUs and Roche Performance Share Plan.
b) Close relatives of Dr Keller held 1,100 Roche shares (2017: 1,100 Roche shares).
c) M. Heuer held 4,897 Restricted Stock Units (RSUs), whereof 1,519 were issued in 2016, 1,532 in 2017 and 1,846 in 2018. RSU's terms and vesting conditions of these awards are disclosed in Note 27 to the Roche Group Annual Financial Statements.
d) Close relatives of M. Heuer held 729 Roche non-voting equity securities.

At 31 December 2018 members of the Corporate Executive Committee held Stock-settled Stock Appreciation Rights (S-SARs) as shown in the table below. The terms and vesting conditions of these awards are disclosed in Note 27 to the Roche Group Annual Financial Statements and additional supplementary information is in the Remuneration Report included in the Annual Report on pages 120 to 146.

S-SARs awards held at 31 December 2018

Year of issue	2018	2017	2016	2015	2014	2013	2012	Total
S. Schwan	100,677	85,476	89,517	59,997	54,453	30,000	0	420,120
M. Heuer[a)]	15,402	12,381	12,840	9,120	8,076	10,392	0	68,211
A. Hippe	40,275	34,191	35,811	24,003	21,783	0	0	156,063
G.A. Keller	37,758	32,052	33,570	22,503	20,424	0	0	146,307
D. O'Day	62,919	53,424	55,950	30,000	27,231	0	0	229,524
C.A. Wilbur	21,402	16,032	15,339	4,164	5,754	4,594	0	67,285
Total CEC	**278,433**	**233,556**	**243,027**	**149,787**	**137,721**	**44,986**	**0**	**1,087,510**
Strike price (CHF)	220.80	251.90	251.50	256.10	263.20	214.00	157.50	
Expiry date	Mar. 2025	Mar. 2024	Mar. 2023	Mar. 2022	Mar. 2021	Mar. 2020	Mar. 2019	

a) Close relatives of M. Heuer held 460 S-SARs issued in 2012 (strike price: CHF 157.50; expiry date: 8 March 2019; grant value per S-SAR: CHF 24.41).

In 2016, Restricted Stock Units (RSUs) as remuneration component for the Corporate Executive Committee were replaced by awarding of corresponding Performance Share Plan (PSP) awards. RSU awards vest to the recipient after three years only. Thereafter, the non-voting equity securities may remain blocked for up to ten years. At 31 December 2018 members of the Corporate Executive Committee did not hold any RSUs except for Michael Heuer as disclosed above.

At 31 December 2018 members of the Corporate Executive Committee as shown in the table below held PSP awards from the PSP performance cycles 2017–2019 and 2018–2020. The terms and vesting conditions of these awards are disclosed in Note 27 to the Roche Group Annual Financial Statements and additional supplementary information is in the Remuneration Report included in the Annual Report on pages 120 to 146. Each award will result in between zero and two non-voting equity securities or shares (before value adjustment), depending upon the achievement of the performance targets and the discretion of the Board of Directors. After vesting, the non-voting equity securities or shares may remain blocked for up to ten years. At the end of the 2016–2018 cycle the performance targets were not achieved and accordingly the participants received none of the originally targeted shares. The total target number of awards for the other outstanding performance cycles at 31 December 2018 are shown in the table below.

Roche Performance Share Plan (PSP) awards held at 31 December 2018

	PSP 2018–2020	PSP 2017–2019
S. Schwan	11,076	11,565
M. Heuer[a)]	0	0
A. Hippe	4,430	4,626
G.A. Keller	4,153	4,337
D. O'Day[b)]	6,923	7,228
C.A. Wilbur	2,353	2,168
Total CEC	**28,935**	**29,924**
Allocation date	Feb. 2021	Feb. 2020

a) M. Heuer is not participating in the PSP programme.
b) Potential awards will be reduced due to resignation.

Information relating to the number and value of rights, options and awards granted to employees of the Roche Group and members of the Board of Directors and Corporate Executive Committee of the Company are disclosed in Note 27 and Note 31 to the Roche Group Annual Financial Statements.

Appropriation of Available Earnings

Proposals to the Annual General Meeting in CHF

	2018	2017
Available earnings		
Balance brought forward from previous year	918,813,395	877,981,254
Net profit for the year	7,653,109,954	7,200,102,551
Total available earnings	**8,571,923,349**	**8,078,083,805**
Appropriation of available earnings		
Distribution of an ordinary dividend of CHF 8.70 gross per share and non-voting equity security *(Genussschein)* as against CHF 8.30 last year	(7,504,295,490)	(7,159,270,410)
Total appropriation of available earnings	**(7,504,295,490)**	**(7,159,270,410)**
To be carried forward on this account	**1,067,627,859**	**918,813,395**

KPMG

Statutory Auditor's Report

To the General Meeting of Roche Holding Ltd, Basel

Report on the Audit of the Financial Statements

Opinion

We have audited the financial statements of Roche Holding Ltd, which comprise the balance sheet as at 31 December 2018, the income statement for the year then ended, and notes to the financial statements, including a summary of significant accounting policies.

In our opinion the financial statements (pages 165 to 173) for the year ended 31 December 2018 comply with Swiss law and the company's articles of incorporation.

Basis for Opinion

We conducted our audit in accordance with Swiss law and Swiss Auditing Standards. Our responsibilities under those provisions and Standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of our report. We are independent of the entity in accordance with the provisions of Swiss law and the requirements of the Swiss audit profession and we have fulfilled our other ethical responsibilities in accordance with these requirements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Report on Key Audit Matters based on the circular 1/2015 of the Federal Audit Oversight Authority

Key audit matters are those matters that, in our professional judgement, were of most significance in our audit of the financial statements of the current period. We have determined that there are no key audit matters to communicate in our report.

Responsibility of the Board of Directors for the Financial Statements

The Board of Directors is responsible for the preparation of the financial statements in accordance with the provisions of Swiss law and the company's articles of incorporation, and for such internal control as the Board of Directors determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, the Board of Directors is responsible for assessing the entity's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless the Board of Directors either intends to liquidate the entity or to cease operations, or has no realistic alternative but to do so.

Auditor's Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Swiss law and Swiss Auditing Standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

KPMG

As part of an audit in accordance with Swiss law and Swiss Auditing Standards, we exercise professional judgement and maintain professional scepticism throughout the audit. We also:

— Identify and assess the risks of material misstatement of the financial statements, 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 opinion. 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 internal control relevant to the audit 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 internal control.

— Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made.

— Conclude on the appropriateness of the Board of Directors' 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 entity's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. 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 entity to cease to continue as a going concern.

We communicate with the Board of Directors or its relevant committee 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 the Board of Directors or its relevant committee with a statement that we have complied with relevant ethical requirements regarding independence, and communicate with them all relationships and other matters that may reasonably be thought to bear on our independence, and where applicable, related safeguards.

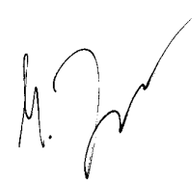
From the matters communicated with the Board of Directors or its relevant committee, we determine those matters that were of most significance in the audit of the financial statements of the current period and are therefore the key audit matters. We describe these matters in our auditor's report, unless law or regulation precludes public disclosure about the matter or when, in extremely rare circumstances, we determine that a matter should not be communicated in our report because the adverse consequences of doing so would reasonably be expected to outweigh the public interest benefits of such communication.

Report on Other Legal and Regulatory Requirements

In accordance with article 728a para. 1 item 3 CO and the Swiss Auditing Standard 890, we confirm that an internal control system exists, which has been designed for the preparation of financial statements according to the instructions of the Board of Directors.

We further confirm that the proposed appropriation of available earnings complies with Swiss law and the company's articles of incorporation. We recommend that the financial statements submitted to you be approved.

KPMG AG



Mark Baillache
Licensed Audit Expert
Auditor in Charge

Marc Ziegler
Licensed Audit Expert

Basel, 28 January 2019

KPMG AG, Viaduktstrasse 42, PO Box 3456, CH-4002 Basel

Published by
F. Hoffmann-La Roche Ltd
Group Communications
4070 Basel, Switzerland
Tel.: +41 (0)61 688 11 11
www.roche.com

To order/download publications
Internet: roche.com/publications
E-mail: basel.warehouse-services@roche.com
Fax: +41 (0)61 688 69 02

Media Relations
Tel.: +41 (0)61 688 88 88
E-mail: media.relations@roche.com

Investor Relations
Tel.: +41 (0)61 688 88 80
E-mail: investor.relations@roche.com

Corporate Sustainability Committee
Tel.: +41 (0)61 688 40 18
E-mail: corporate.sustainability@roche.com

Next Annual General Meeting:
5 March 2019

Cautionary statement regarding forward-looking statements
This Annual Report contains certain forward-looking statements. These forward-looking statements may be identified by words such as 'believes', 'expects', 'anticipates', 'projects', 'intends', 'should', 'seeks', 'estimates', 'future' or similar expressions or by discussion of, among other things, strategy, goals, plans or intentions. Various factors may cause actual results to differ materially in the future from those reflected in forward-looking statements contained in this Annual Report, among others: (1) pricing and product initiatives of competitors; (2) legislative and regulatory developments and economic conditions; (3) delay or inability in obtaining regulatory approvals or bringing products to market; (4) fluctuations in currency exchange rates and general financial market conditions; (5) uncertainties in the discovery, development or marketing of new products or new uses of existing products, including without limitation negative results of clinical trials or research projects, unexpected side effects of pipeline or marketed products; (6) increased government pricing pressures; (7) interruptions in production; (8) loss of or inability to obtain adequate protection for intellectual property rights; (9) litigation; (10) loss of key executives or other employees; and (11) adverse publicity and news coverage.

The statement regarding earnings per share growth is not a profit forecast and should not be interpreted to mean that Roche's earnings or earnings per share for 2019 or any subsequent period will necessarily match or exceed the historical published earnings or earnings per share of Roche.

Links to third-party pages are provided for convenience only. We do not express any opinion on the content of any third-party pages and expressly disclaim any liability for all third-party information and the use of it.

The Roche Finance Report is published in German and English. In case of doubt or differences of interpretation, the English version shall prevail over the German text.

Our reporting consists of the actual Annual Report and of the Finance Report and contains the annual financial statements and the consolidated financial statements. With regards to content, the Management Report as per the Articles of Incorporation consists of both aforementioned reports with the exception of the Remuneration Report.

Printed on non-chlorine bleached, FSC-certified paper.

F. Hoffmann-La Roche Ltd
4070 Basel, Switzerland

www.roche.com

HER JOURNEY TO RECOVERY

The woman shown on the cover of the Roche Finance Report this year appeared on the cover of our 2017 report as well. Last year she was in the midst of receiving treatment for her breast cancer when photographed and this came through powerfully on the cover.

Now, a year later, she is enjoying life again.

7 001 005