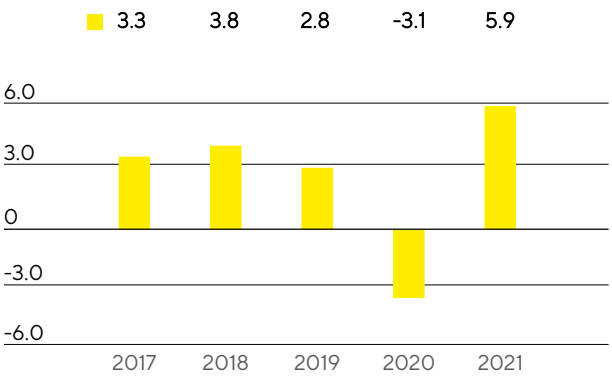
Macroeconomic Environment and Conditions in the Sectors

The sectors in which the Sartorius Group is active differ in their dependence on the economy. The Bioprocess Solutions Division, for instance, operates in an environment that is largely independent of economic fluctuations. The Lab Products & Services Division, in contrast, is partly active in sectors whose development is more strongly affected by economic factors.

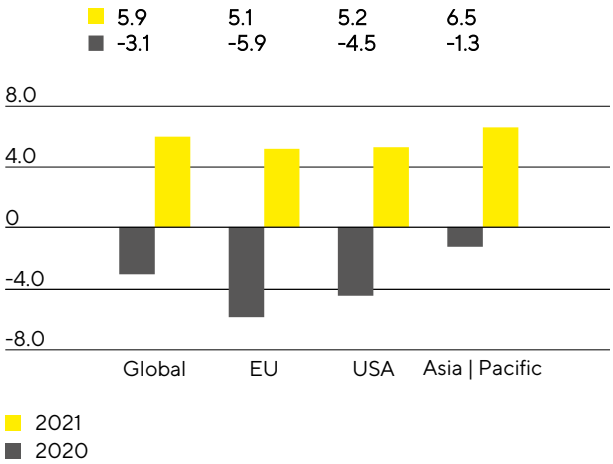
Global Economy on Road to Recovery

In the reporting year, the global economy recovered from the recession caused by the pandemic in 2020. According to estimates by the International Monetary Fund (IMF), global gross domestic product increased by 5.9%. The economy in the industrialized countries grew by 5.2% and growth in the emerging and developing countries was 6.4%. Particularly in the first half of the year, economic activity increased significantly, while rising levels of infections, supply bottlenecks, and restricted transport capacity weakened momentum somewhat during the rest of the year. During the reporting year consumer prices increased markedly in many countries for the first time since the financial crisis of 2008/2009. In addition to the sharp rise in demand compared with the prior year, the IMF attributes inflation to higher commodity prices and a supply shortage partly caused by the pandemic and assesses the effects to be temporary.

Global Development GDP (2017 to 2021)
in %



Gross Domestic Product by Region
in %



Source: International Monetary Fund

Lifting the restrictions associated with combating the pandemic led to a recovery of the economy in Sartorius' European core markets. The service sector in particular benefited from catch-up effects, whereas growth in industry was slowed somewhat due to high costs of raw materials and supply bottlenecks in preliminary products. According to the IMF, the European Union's economic output increased by 5.0% (2020: -6.0%). In Germany, the increase in 2021 was 3.1% (2020: -4.6%), in France GDP rose by 6.3% (2020: -8.0%), and in the UK it rose by 6.8% (2020: -9.8%).

The U.S. economy grew by 6.0% in the reporting year (2020: -3.4%). In addition to a still expansionary monetary policy, extensive government stimulus programs provided positive economic impetus. Falling unemployment figures, stable consumer spending, and high willingness by corporations to invest also had a beneficial effect.

Gross domestic product in the Asia-Pacific economic area increased by 6.5% (2020: -1.3%). The region's growth engine is still China, which was the only major economy to report a positive growth rate in the prior year and grew by 8.0% in 2021 according to IMF estimates (2020: +2.3%). However, momentum slowed noticeably during the year, partly due to the reduction of monetary- and fiscal-policy support measures and to the reintroduction of coronavirus containment measures for periods of time. Other countries in this region that are important for Sartorius also developed positively. South Korean economic output grew by 4.3% (2020: -0.9%), in India the increase was 9.5% (2020: -7.3%) and in Japan, 2.4% (2020: -4.6%).

Exchange Rate and Interest Rate Trends

In addition to the euro, the currencies relevant to the Sartorius Group include the U.S. dollar in particular as well as a number of other currencies, such as the British pound, the Singapore dollar, the South Korean won, the Japanese yen, the Chinese renminbi, and the Swiss franc.

Exchange Rates Against the Euro

	Year-end Exchange Rates		Average Exchange Rate	
	2021	2020	2021	2020
U.S. dollar	1.13245	1.22785	1.18270	1.14196
British pound	0.83902	0.89808	0.85972	0.88951
Singapore dollar	1.52820	1.62260	1.58913	1.57408
South Korean won	1347.6900	1334.0800	1353.74171	1345.63574
Japanese yen	130.36000	126.52000	129.87475	121.80849
Chinese renminbi	7.18870	8.0314	7.62740	7.87300
Swiss franc	1.03336	1.08198	1.08106	1.07042

Interest rates remained at a very low level on average throughout the reporting year. The European Central Bank kept its key interest rate at 0.00%. The 3-month EURIBOR – i.e., the rate of interest on fixed-term deposits denominated in euros in interbank business – stood at -0.57% as of December 31, 2021 (2020: -0.55%).

Sources: International Monetary Fund: World Economic Outlook, October 2021; Bloomberg.

Conditions in the Sectors

Sartorius' key customer groups include the biopharmaceutical and pharmaceutical industries as well as public research institutions. In addition, the company's customers include quality control laboratories in the chemical and food industries. Accordingly, the progress of the Group's business depends on developments in these industries.

Strong Growth in the Biopharmaceutical Market

The global pharma market performed significantly better in the reporting year than in previous years, expanding by around 14% according to EvaluatePharma. This was especially due to strong growth in the biopharmaceutical segment, which rose overproportionately by around 29% to €350 billion in 2021. The reason for this growth was significant additional revenue with coronavirus vaccines and Covid-19 therapeutics estimated at more than €80 billion, which also led to an increase in the biopharma share of the total pharma market from 30% to 34%.

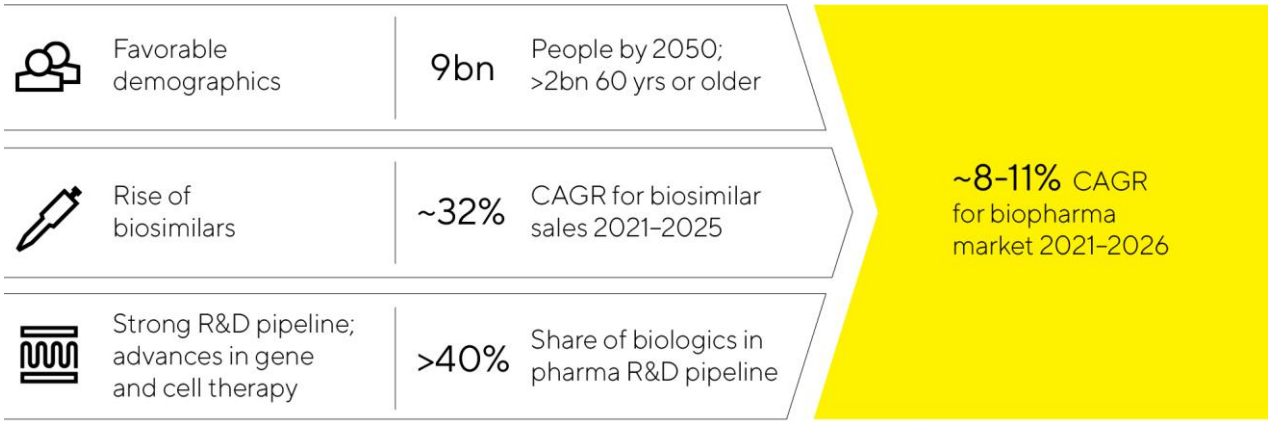
The pharma and biotech industries played a key role in helping to cope with the coronavirus pandemic in the reporting year by developing vaccines and therapeutics. After many vaccine candidates had progressed through the various development stages and initial compounds had been approved at record speed in 2020, more than 40 vaccines and medications have meanwhile received market approval in at least one country. The development activities were accompanied by a considerable expansion of production capacity, with the result that several billion vaccine doses were produced and more than 3.5 billion people were fully vaccinated in 2021. Demand associated with research activities and advancing commercial production led to very positive business performance by suppliers of bioprocess technology, which also benefited from a continuing strong non-pandemic core business. High demand for technologies for the development and production of biopharmaceuticals, coupled with an at times tense situation regarding the availability of some preliminary products, services, and logistics capacity led to longer lead times in some cases. All the leading biopharma suppliers invested heavily in capacity expansion in the face of strong growth and order intake, and these investments are expected to normalize delivery times in the future.

The measures to combat the pandemic also had a dampening effect on certain areas of the pharma and biotech industries in the reporting year. For example, clinical trials had to be interrupted or were unable to be resumed. Around 30% of projects were at an advanced stage of development at the time they were interrupted. This could translate to delayed approval for new medications for indications not related to coronavirus. In 2021, no such effect was discernible, and the number of new approvals of products by the American Food and Drug Administration (FDA) remained at a high level at 30 (2020: 26).

The growth of the biopharma market fundamentally depends more on medium- to long-term trends than on short-term economic developments. In addition to the market launch of innovative biopharmaceuticals, significant impetus was provided by the globally increasing demand for drugs and the extension of the range of indications for already approved medications and their further market penetration. The growing significance and acceptance of biologics is reflected not only in their increasing share of sales revenue of the global pharmaceutical market but also in the development activities of the pharmaceutical industry. For example, biopharmaceutical compounds account for more than 40% of the R&D pipeline. A growing number of active substances manufactured using biotech production methods is being approved for the treatment of rare illnesses that have been incurable so far. The pharma industry is increasingly concentrating on advanced therapies, such as cell and gene therapeutics or biotechnologically processed tissue products. At the end of 2021, there were more than 2,600 clinical trials with such treatment approaches, so this area offers significant growth potential over the mid to long term. The rising number of approved biopharmaceuticals as well as an increasing variety of therapy types and substance classes coupled with growing demand for medications are the main drivers for the worldwide increase in production capacities for biopharmaceuticals.

Biosimilars, the generic versions of reference biologics that have lost their patent protection, are also playing an increasingly important role in the biotechnology market. According to market studies, their sales volume in 2021 was still small at an estimated €13.5 billion, but the market is expected to grow strongly during the years to come owing to the expiration of several patents for high-selling biopharmaceuticals and an increasing number of new approvals of biosimilars and market launches. Particularly in the USA, where development has been comparatively slow due to regulatory, patent-law-related, and marketing hurdles, market penetration is expected to accelerate significantly in the next few years. The market volume could more than triple in this country by 2025. A compound annual growth rate of around 32% is projected globally through 2025.

Attractive Market Environment with Good Growth Prospects



Recovery of the Laboratory Market after Prior Year Dampened by the Pandemic

The global laboratory market reached a volume of around €63 billion in the reporting year and is projected to grow at a compound annual growth rate of about 4% to 5% over the long term, according to estimates from several market observers. Market growth is related, among other things, to the levels of research and development spending in the individual end markets, which is partly linked to economic development. In 2021, leading suppliers of laboratory instruments and consumables reported an above-average increase in demand after growth in the prior year had been dampened by the pandemic. In addition to the base effect, the positive trend in the reporting year was due to the easing of coronavirus containment measures, which was accompanied by increasing laboratory activities in all sectors.

Labs in the pharmaceutical and biopharma industries are the leading customer groups for laboratory instruments and consumables. Research spending of this specific sector increased by 7% to around €190 billion in the reporting year according to EvaluatePharma. Against the backdrop of globally rising demand for medications, the industry is continuously investing in research to find new active pharmaceutical ingredients and in laboratory equipment needed to perform this drug discovery. The focus is being placed on technologies related to automation of process workflows and innovative analytical instruments that are equipped with enhanced or novel functionalities. Products from the field of bioanalytics, for example, have above-average growth rates within the laboratory market, and demand in the life science sector is generally growing faster than in other industries. According to the assessment of leading laboratory product manufacturers, this end market also proved to be particularly fast growing and continued to benefit from high additional demand in connection with Covid-19 test capacity and the development of vaccines and therapeutics.

Research and quality-assurance labs in the chemical and food industry are another important customer group. This segment's demand for laboratory products depends in part on economic trends. Additional momentum can also be generated in this sector by regulatory changes, such as stricter requirements for quality control tests in the food industry. Demand from industrial end markets recovered significantly in 2021 following moderate development in the prior year.

Academic and public-sector research institutions also use laboratory instruments and consumables manufactured by Sartorius. Growth in demand is related to such factors as government budgets and funding programs, all of which can vary from one country to another. In the United States, the National Institute of Health (NIH) is the leading government agency for biomedical research and also the world's largest research funding agency. The NIH's budget has constantly grown over the last eight years. During the reporting year, it

climbed again by about 3.9% to €37.5 billion. The financing environment for science has improved overall due to budget increases as part of substantial investment programs by the U.S. government. The European Union has likewise continuously scaled up its research spending in past budget cycles. Around €95.5 billion of research and innovation funding is to be provided in the period from 2021 to 2027, an increase of 19% compared with the previous program. In recent years, China has sharply increased government R&D funding, a trend that has fueled dynamic growth in the laboratory market there. Many manufacturers of laboratory products reported a significant rebound in demand from academic and public research institutions in the reporting year following a weak prior year due to the pandemic.

Competitive Position

The competitive environment of the Bioprocess Solutions Division is characterized by relatively high entry barriers arising in part from the biopharmaceutical industry's strong degree of regulation and its technological complexity. In addition, the supply industry has consolidated strongly in recent years owing to numerous takeovers so most of the market is served by just a few suppliers. In this environment, the Bioprocess Solutions Division operates as a total solutions provider, covering the core process steps in biopharmaceutical production and preceding process development. It has leading market positions in key technologies, especially in the areas of bioreactors, filtration, and the transportation and storage of liquids. The Bioprocess Solutions Division's principal competitors are certain business units at Merck KGaA, Thermo Fisher Scientific Inc., and Danaher Corporation.

The Lab Products & Services Division is positioned as a premium provider of laboratory instruments. It serves both R&D laboratories and quality control laboratories with a focus on the biopharmaceutical industry. The division's product range includes laboratory balances, pipettes, and instruments for bioanalytics, as well as a wide range of lab consumables. The division ranks among the leading providers worldwide in most of these areas. Major competitors include certain divisions at Thermo Fisher Inc., Merck KGaA, and Danaher Corporation. Among these competitors are also Mettler-Toledo Intl. Inc. for laboratory balances in particular; Eppendorf AG for pipettes; and companies such as Agilent Technologies Inc., Becton Dickinson Co., and PerkinElmer Inc. for cell analytics.

Sources: BioPlan: 18th Annual Report and Survey of Biopharmaceutical Manufacturing Capacity and Production, April 2021; IQVIA Institute: Global Medicine Spending and Usage Trends, April 2021; Evaluate Pharma: World Preview 2021, Outlook to 2026, July 2021; BioPlan: Global Assessment Report 2020, June 2021; www.fda.gov

Group Business Development

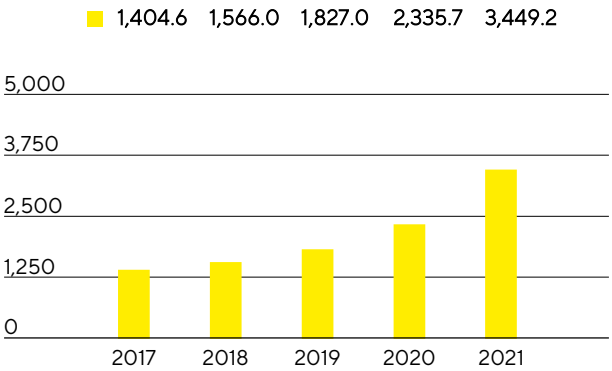
Sales Revenue and Order Intake

In the reporting year, Sartorius grew at an exceptionally dynamic rate of 49.3% to €3,449.2 million in constant currencies (reported: +47.7%) and again significantly more sharply than in the already strong previous year when growth had attained 30.2%. As a result, the Group again slightly exceeded the forecast that had projected an increase in consolidated sales revenue in constant currencies by 19% to 25% at the beginning of the year and had last been raised in July 2021 to a growth rate of about 45%. This increase was attributable to high demand for innovative products and technologies for efficient development and manufacturing of biopharmaceuticals. The need for products required for coronavirus vaccines and test kits added significant momentum, but did not play a dominant role. The impact of these pandemic-related effects on consolidated growth totaled around 16 percentage points. Moreover, the company's most recent acquisitions delivered very positive performance, contributing around 5 percentage points.

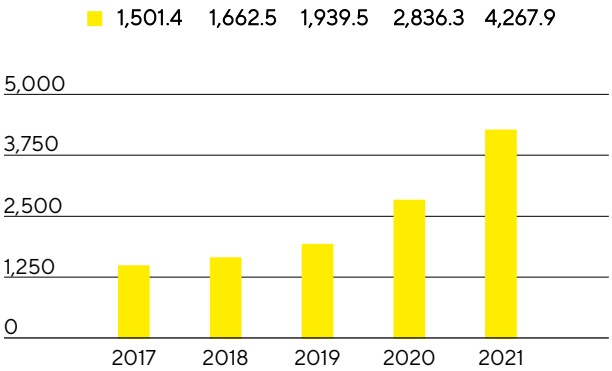
Order intake rose by 52.3% to €4,267.9 million in constant currencies (reported: +50.5%) and thus even slightly more strongly than consolidated sales revenue. About 13 percentage points of this gain were attributed to pandemic effects and close to 7 percentage points to acquisitions. While order intake was significantly higher than sales revenue up into the third quarter, also because some customers placed their orders further in advance than usual in the current situation, the ratio of order intake to sales revenue normalized during the second half of the year and was at the level of the company's long-term average toward the end of the year.

For a full comparison of the Group's business development with its forecast, see page 64.

Sales Revenue 2017 to 2021
€ in millions



Order Intake 2017 to 2021
€ in millions



Sales Revenue and Order Intake

€ in millions	2021	2020	in % reported	in % cc[1]
Sales revenue	3,449.2	2,335.7	47.7	49.3
Order intake	4,267.9	2,836.3	50.5	52.3

1 In constant currencies

High Growth Rates in Both Divisions

Both divisions and all business regions contributed to strong growth in fiscal 2021. The Bioprocess Solutions Division expanded at an exceptionally robust rate, despite a high prior-year base, by 54.7% to €2,727.0 million in constant currencies (reported: +53.0%). In particular, business with manufacturers of biopharmaceutical medications performed very well. Beyond this, pandemic-related demand essentially due to coronavirus vaccine production ramped up by some customers added about 20 percentage points to the division's sales expansion. Non-organic growth contributed by acquisitions was close to 5 percentage points.

The Lab Products & Services Division, which specializes in products and technologies for life science research and pharmaceutical laboratories, also saw sales revenue grow substantially by 32.0% in constant currencies to €722.2 million (reported: +30.6%) compared to prior-year performance dampened by the pandemic. The major part of this sales increase was organic, with components in coronavirus test kits accounting for around 6 percentage points. Acquisitions contributed about 6 percentage points. Development was especially dynamic in the strategic growth area of bioanalytics.

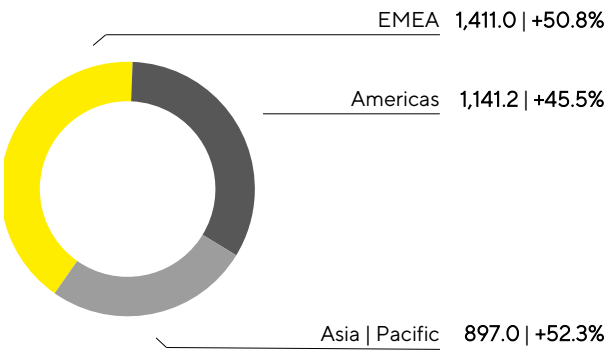
Sales by Division

€ in millions	2021	2020	in % reported	in % cc
Bioprocess Solutions	2,727.0	1,782.6	53.0	54.7
Lab Products & Services	722.2	553.0	30.6	32.0

Further information on the business development of the Group divisions is given on pages 54 et seq. for the Bioprocess Solutions Division and on pages 59 et seq. for the Lab Products & Services Division.

Gains in All Regions

Sales Revenue and Growth[1] by Region[2]
€ in millions unless otherwise specified



1 In constant currencies
2 Acc. to customers' location

Sartorius increased its sales revenue in 2021 in all three business regions with comparable dynamics.

Sales in the EMEA region that contributed the highest share of around 41% to total Group revenue amounted to €1,411.0 million, equating to a gain of 50.8%. Bolstered by especially robust business with vaccine

manufacturers, the Bioprocess Solutions Division saw exceptionally strong growth of 61.8% in this region. The Lab Products & Services Division recorded a significant gain of 18.3% as well.

Sales revenue in the Americas region also rose sharply again by 45.5% to €1,141.2 million. Thus, the region's share of Group sales was 33%. The Bioprocess Solutions Division saw very dynamic development, recording a gain of 45.1%, as did the Lab Products & Services Division, which reported growth of 47.2% that was significantly driven by acquisitions and the division's rapidly growing bioanalytics business.

Business in the Asia | Pacific region, which accounted for around 26% of total Group revenue in 2021, generated the highest growth rate at 52.3% in the reporting year, attaining €897.0 million. In particular, the Bioprocess Solutions Division showed very strong growth, with sales up 57.7%. The Lab Products & Services Division expanded significantly by 37.3% compared to the prior-year revenue base that was relatively moderate due to the pandemic.

All growth rates are in constant currencies unless otherwise stated.

Sales by Region

€ in millions	2021	2020	in % reported	in % cc
EMEA	1,411.0	935.1	50.9	50.8
Americas	1,141.2	812.2	40.5	45.5
Asia	Pacific	897.0	588.4	52.5	52.3

Costs and Earnings

In the reporting year, the cost of sales rose by 42.6% to €1,610.3 million, and the cost of sales ratio decreased from 48.3% in the previous year to 46.7% against the background of favorable product mix effects.

The further cost items developed at a considerably underproportionate rate with respect to sales revenue due to economies of scale and to a partially deferred cost development related to the pandemic. Selling and distribution costs thus rose by 32.4% to €580.7 million so the ratio of these costs to sales revenue decreased year over year by around 2 percentage points from 18.8% to 16.8%. Expenses for research and development rose by 29.0% to €139.9 million. The corresponding ratio of R&D expenses to sales revenue was 4.1% (previous year: 4.6%). Regarding general administrative expenses, Sartorius reported an increase of 31.0% to €165.0 million, and the administrative expense ratio in 2021 was 4.8% (previous year: 5.4%).

The balance of other operating income and expenses was -€50.2 million in fiscal 2021 compared to the prior-year figure of -€77.3 million and essentially covered extraordinary items of -€40.7 million relative to -€57.7 million in 2020. These extraordinary items consisted primarily of expenses in connection with the most recent acquisitions as well as of expenses for various cross-divisional projects and rebranding.

EBIT nearly doubled, rising by 98.1% to €903.2 million. The respective EBIT margin rose as a result from 19.5% a year ago to 26.2% in the reporting year.

The financial result was -€234.7 million in 2021 relative to -€31.3 million a year earlier. This figure includes an expense item of -€207.7 million from the reporting date valuation of the share-based earn-out liability in connection with the acquisition of BIA Separations; this liability essentially resulted from the increase in the respective share price as well as strong sales development.

In the reporting year, tax expenses of €241.4 million were above the prior-year total of €125.2 million. The tax rate was 36.1% after 29.5% in the previous year. It should be noted that the valuation effect in the financial result mentioned above will not result in any subsequent tax impact. If this valuation effect would have had a tax impact, this would have yielded a tax rate of 27.6%.

Net profit for the period increased at a significantly overproportionate rate in relation to sales revenue, by 42.5% to €427.0 million (2020: €299.6 million).

Net profit attributable to shareholders of Sartorius AG surged 51.8% to €318.9 million in the reporting year, up from €210.1 million in 2020. Non-controlling interest stood at €108.1 million (previous year: €89.5 million), which essentially reflected shares in Sartorius Stedim Biotech S.A. not held by the Sartorius Group.

Statement of Profit or Loss

€ in millions	2021	2020	Δ in %
Sales revenue	3,449.2	2,335.7	47.7
Cost of sales	–1,610.3	–1,129.3	–42.6
Gross profit on sales	**1,838.9**	**1,206.4**	**52.4**
Selling and distribution costs	–580.7	–438.7	–32.4
Research and development costs	–139.9	–108.4	–29.0
General administrative expenses	–165.0	–125.9	–31.0
Other operating income and expenses	–50.2	–77.3	35.1
Earnings before interest and taxes (EBIT)	**903.2**	**456.0**	**98.1**
Financial income	29.3	35.9	–18.3
Financial expenses	–264.0	–67.1	–293.4
Financial result	**–234.7**	**–31.3**	**–650.7**
Profit before tax	**668.4**	**424.7**	**57.4**
Income taxes	**–241.4**	**–125.2**	**–92.2**
Net profit for the period	**427.0**	**299.6**	**42.5**
Attributable to:			
Equity holders of Sartorius AG	318.9	210.1	51.8
Non-controlling interest	108.1	89.5	20.8

1 The figures for the reporting period 2020 were restated due to the finalization of the purchase price allocation for the acquisitions of BIA Separations and WaterSep BioSeparations.

Underlying EBITDA

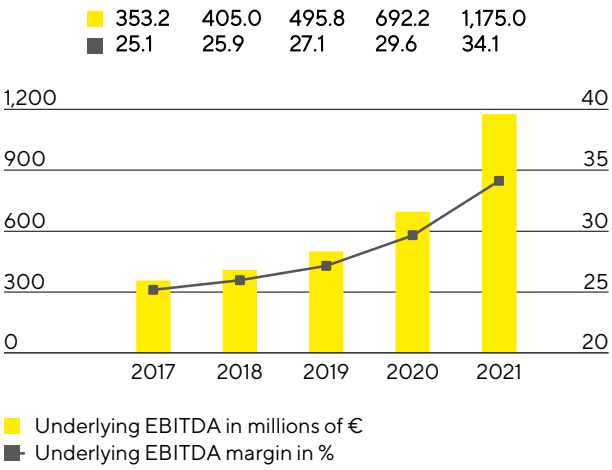
The Sartorius Group uses underlying EBITDA – earnings before interest, taxes, depreciation and amortization and adjusted for extraordinary items – as its key profitability indicator to provide a better picture of its operating development, also in an international comparison. More information on extraordinary items is provided on page 169.

Reconciliation from EBIT to Underlying EBITDA

€ in millions	2021	2020
EBIT	903.2	456.0
Extraordinary items	40.7	57.7
Amortization | depreciation	231.1	178.5
Underlying EBITDA	1,175.0	692.2

In fiscal 2021, the Sartorius Group strongly increased its earnings. Underlying EBITDA thus showed a significantly overproportionate increase in relation to sales revenue, by 69.7% to €1,175.0 million. The respective underlying EBITDA margin climbed to 34.1% (2020: 29.6%) and was therefore within the range of the Group's forecast, which had been specified at around 30.5% at the beginning of the reporting year and had been raised in July 2021 to around 34.0%. Besides being attributable to economies of scale, this considerable increase was influenced by partially deferred cost development, for example as a result of low travel activity because of the pandemic and deferred new hires in relation to sales growth. This trend subsided due to the intensified buildup of the workforce in the second half of the reporting year, as well as to rising costs in logistics and purchasing. Currency effects as well as the most recent acquisitions did not have any material impact on the company's margin development.

Underlying EBITDA[1] and Margin



1 Underlying = excluding extraordinary items

Underlying EBITDA by Division

	Underlying EBITDA € in millions	Underlying EBITDA margin in %
Group	1175.0	34.1
Bioprocess Solutions	986.3	36.2
Lab Products & Services	188.8	26.1

Underlying EBITDA of the Bioprocess Solutions Division was €986.3 million, significantly above the year-earlier figure by 71.3%. The division's respective margin was substantially up year over year from 32.3% to 36.2%. Economies of scale as well as deferred cost development in some areas due to the pandemic contributed to this rise in profitability. Currency effects as well as the most recent acquisitions did not have any material impact on the earnings margin.

In the Lab Products & Services Division, underlying EBITDA soared by 62.3% to €188.8 million and its corresponding margin reached 26.1% (previous year: 21.0%). This strong increase in profitability was based on economies of scale as well as a positive product mix that particularly reflected the growing significance of the bioanalytics portfolio. A positive effect resulted from the acquisition of the Octet business in 2020 in the bioanalytics area, while currency effects did not have a significant impact on the division's profit margin.

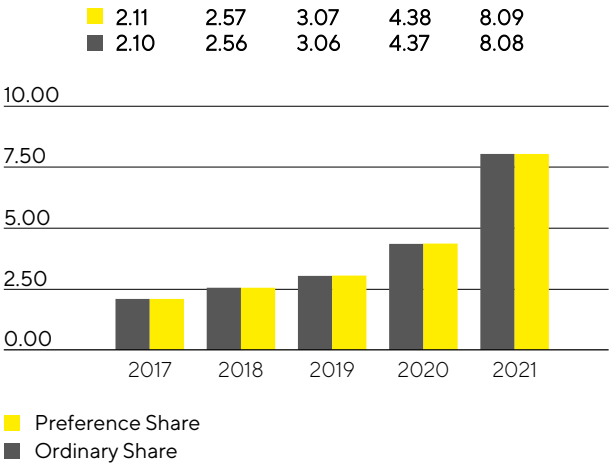
Relevant Net Profit

The relevant net profit attributable to the shareholders of Sartorius AG rose steeply compared to the previous year by 84.9% to €553.4 million. This figure is the basis for determining the profit to be appropriated, and is calculated by adjusting for extraordinary items and eliminating non-cash amortization, as well as is based on the normalized financial result and the normalized tax rate. Underlying earnings per ordinary share soared 85.0% to €8.08, up from €4.37 a year earlier, and by 84.8% per preference share to €8.09, up from €4.38 a year ago.

€ in millions	2021	2020[1]
EBIT	903.2	456.0
Extraordinary items	40.7	57.7
Amortization	88.4	59.7
Normalized financial result[2]	–28.1	–23.8
Normalized income tax (27%)[3]	–271.1	–148.4
Underlying earnings	733.1	401.3
Non-controlling interest	–179.7	–102.0
Underlying earnings after taxes and non-controlling interest	553.4	299.3
Underlying earnings per share		
per ordinary share (in €)	8.08	4.37
per preference share (in €)	8.09	4.38

1 The figures for the 2020 reporting period were restated due to the finalization of the purchase price allocation for the acquisitions of BIA Separations and WaterSep BioSeparations.
2 Financial result adjusted for valuation effects from the subsequent measurement of contingent purchase price liabilities as well as for effects of foreign currency translation and hedging.
3 Income tax considering the average expected group tax rate, based on the underlying profit before tax.

Underlying Earnings per Share[1]
in €



1 After non-controlling interest, adjusted for extraordinary items and non-cash amortization, as well as based on the normalized financial result and the normalized tax rate.

Further information on earnings development and extraordinary items for the Group divisions is given on pages 56 et seq. and 61 et seq.

Research and Development

Sartorius continuously expands its product portfolio by investing in both the new and further development of its products, as well as in the integration of new technologies through alliances. In 2021, the Sartorius Group spent €139.9 million on R&D, corresponding to an increase of 29.0% over the previous year's investment. The ratio of R&D costs to sales revenue stood at 4.1%, slightly below the previous year's level of 4.6%, against the backdrop of the strong increase in sales revenue.

The International Financial Reporting Standards (IFRS) require certain development costs to be capitalized on the statement of financial position and then to be amortized over subsequent years. In the reporting year, these development investments amounted to €50.9 million compared with €43.6 million the year before. This equates to a share of 26.7% (previous year: 28.7%) of the Group's total R&D expenses. Scheduled amortization related to capitalized development costs totaled €24.3 million in 2021 (previous year: €22.1 million). These expenses were disclosed in the cost of sales. The gross capital expenditure ratio, which is even more meaningful for assessment of innovation-related expenses and includes capitalized development costs, was 5.5%, down from prior-year ratio of 6.5%, because of the significant increase in sales revenue.

At Sartorius, we pursue a strategic intellectual and industrial property rights policy across our divisions to protect our expertise. The Group systematically monitors compliance with these rights on a cost | benefit basis to determine which specific individual rights are to be maintained.

In 2021, Sartorius filed a total of 155 applications for intellectual and industrial property rights (2020: 273). As a result of these applications, including those of prior years, we were issued 298 patents and trademarks during the reporting year (2020: 459). As of the reporting date, we had a total of 5,479 patents and trademarks in our portfolio (2020: 5,110).

Further information is provided in the sections covering the individual divisions on pages 54 et seq. and 59 et seq.

Capital Expenditures

Against a backdrop of exceptionally strong organic growth, Sartorius invested considerably in building up new capacities in all regions in the reporting year. In this context, expansion projects already planned were moved ahead of schedule, accelerated and extended. In addition to significantly expanding production capacities, the investment program aims to further diversify and increase the flexibility of the company's production network. Several expansion projects were already completed in 2021 and thus already contributed to meeting high demand. In the current reporting year, the company plans to complete a number of additional projects.

In 2021, capital expenditures of €407.2 million were significantly higher than the prior-year figure of €240.3 million, as planned. The ratio of capital expenditures to sales revenue was 11.8% and thus slightly below the forecast of 12% adjusted at mid-year (2020: 10.3%) due to strong sales growth.

Investments were made, among others, in Group headquarters based in Göttingen, Germany, where capacities for membrane manufacturing are being expanded and new laboratory space for product development is under construction.

At the site in Yauco, Puerto Rico, Sartorius is extending cleanroom capacity for manufacturing products for the Separation and Fluid Management areas. In addition, a production facility for cell culture media is being set up here for the first time and is scheduled to go into operation in 2023.

Extensive investments were made in the Asia | Pacific region, such as in Beijing, China, where additional cleanroom space was created for the production of filters and single-use bags, as well as a quality control laboratory. In Songdo, South Korea, Sartorius is planning to build a plant for manufacturing cell culture media and assembling sterile consumables. Moreover, a technology center for product demonstrations for customers and consultations as well as laboratory facilities are scheduled to be built at this new site that is located in the center of a biopharma hub.

Due to strong growth in demand and order intake, production capacities were also expanded in the reporting year at other sites. For instance, expansion projects were conducted in Finland, France, Israel, Slovenia, Tunisia, and the U.K. Beyond these sites, a new Customer Interaction Center used for product demonstrations and factory acceptance testing was opened in each of the countries in China, the USA, and Germany to strengthen customer proximity and regional presence.

In addition, investments were made in the digital infrastructure of the Group. Thus, Group-wide implementation of a new CRM system was completed.

Employees

The numbers of employees reported include all staff members of the Sartorius Group except for vocational trainees, interns, employees on extended leaves of absence, and those participating in an early retirement plan. Numbers are reported as head counts.

As of the reporting date on December 31, 2021, the Sartorius Group employed 13,832 people in 37 countries, 3,195 people or 30.0% more than in the previous year. This number includes the 125 employees who joined the Sartorius Group in the reporting year through acquisitions. Owing to the high increase in sales, numerous additional employees were hired especially for production functions. Overall, however, the buildup of workforce progressed at a deferred rate in comparison with sales development up to mid-2021 due to the lockdown in many countries and the associated reduction in recruiting activities. This affected in particular our sales, marketing, and development functions. In contrast, during the second half of the year, new employees were increasingly hired again in these functions as well.

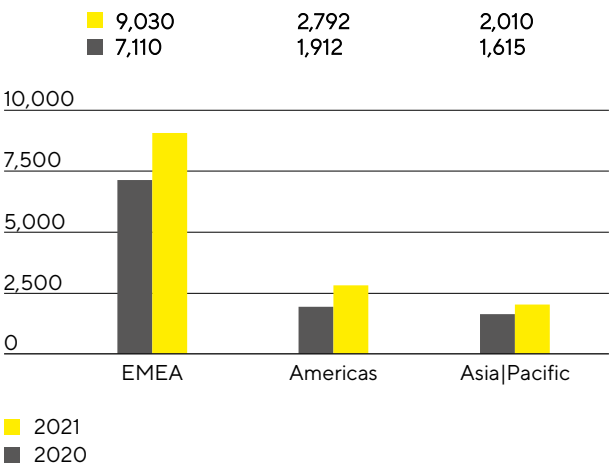
Employees

	2021	2020	Increase in %
Group	**13,832**	**10,637**	**30.0%**
Bioprocess Solutions	10,745	7,821	37.4%
Lab Products & Services	3,087	2,816	9.6%

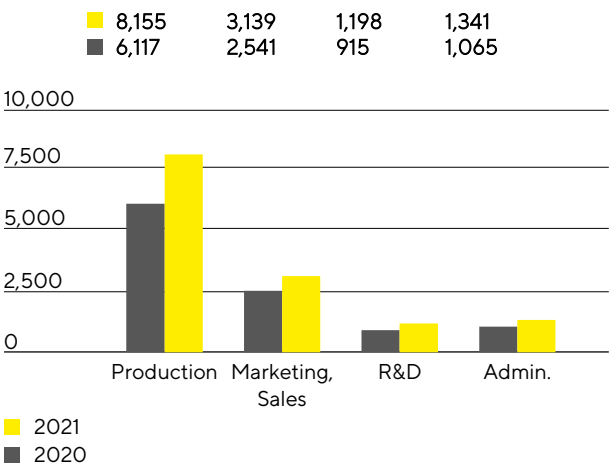
As of the end of the reporting year, the Bioprocess Solutions Division employed 10,745 people (2020: 7,821) and the Lab Products & Services Division 3,087 (2020: 2,816).

Employees in central administrative functions were allocated to the divisions in proportion to the cost of the services they performed during the year.

Employees by Region



Employees by Function



Head count in the EMEA region rose by 1,920 new employees, a gain of 27.0%. As of the end of the reporting year, Sartorius employed 4,637 people in Germany, or 33.5% of the total Group workforce.

The Americas region reported the highest increase in staff, with growth of 46.0% or 880 new people. The number of employees in the Asia | Pacific region grew by 24.5% or 395 people.

At the end of 2021, around 59% of all Sartorius employees worked in production. This head count includes production staff and employees in other areas such as technical services. The number of employees in this area was 8,155 or 33.3% more than in the prior year.

In marketing and sales, 3,139 people were employed at year-end, an increase of 23.5%. They made up about 23% of the total Group workforce.

Around 9% of all our employees worked in research and development. The total number of R&D staff was 1,198, representing growth of 283 employees or 30.9% over the prior year.

Administration recorded 1,341 employees as of the reporting date. This corresponds to an increase of 25.9% compared with the prior-year period and a share of 10% of all Sartorius staff.

For more information on employees, see the Non-Financial Group Statement starting on page 122.

Net Worth and Financial Position

Cash Flow

In the reporting year, Sartorius again significantly increased its cash flow from operating activities. This figure amounted to €865.8 million relative to €511.5 million a year ago, which equates to a rise of 69.3%. The development is essentially due to growth in earnings, whereas growth-driven buildup of working capital as well as higher tax payment liabilities had a dampening effect. The sale of trade receivables within the scope of a factoring program resulted in an inflow of €40.6 million (inflows in the previous year: €88.6 million).

Due to exceptionally high demand, Sartorius has been driving the expansion of its production capacities full speed ahead. In particular, the company's investment program covers ahead-of-schedule expansion of sites in Germany and Puerto Rico. Cash outflows from investing activities increased in the reporting period by 72.3% to €427.9 million. Because of acquisition-related expenses of €141.7 million in connection with the most recent purchases of the companies Xell and CellGenix, cash flow from investing activities and acquisitions was -€569.6 million. The prior-year figure of -€1,270.5 million essentially included cash outflows related to the acquisition of the life science businesses from Danaher as well as of BIA Separations.

Primarily driven by dividend disbursements and repayment of loans, cash flow from financing activities amounted to -€165.2 million in the reporting year relative to €907.5 million in fiscal 2020 in which Sartorius had financed acquisitions by issuing new note loans ("Schuldscheindarlehen"), among other means.

Cash Flow Statement

€ in millions	2021	2020
Cash flow from operating activities	865.8	511.5
Cash flow from investing activities and acquisitions	–569.6	–1,270.5
Cash flow from financing activities	–165.2	907.5
Cash and cash equivalents	342.8	203.4
Gross debt	2,075.5	2,087.4
Net debt	1,732.7	1,883.9

Consolidated Statement of Financial Position

The balance sheet total of the Sartorius Group was €5,697.9 million as of the end of fiscal 2021 and thus €1,213.2 million higher than the prior-year level. This rise reflects the increase in property, plant and equipment as a result of continuous investing activities as well as the growth-driven buildup of working capital, among other things. Non-current assets thus rose by €625.7 million to €3,901.1 million; current assets increased by €587.5 million to €1,796.8 million.

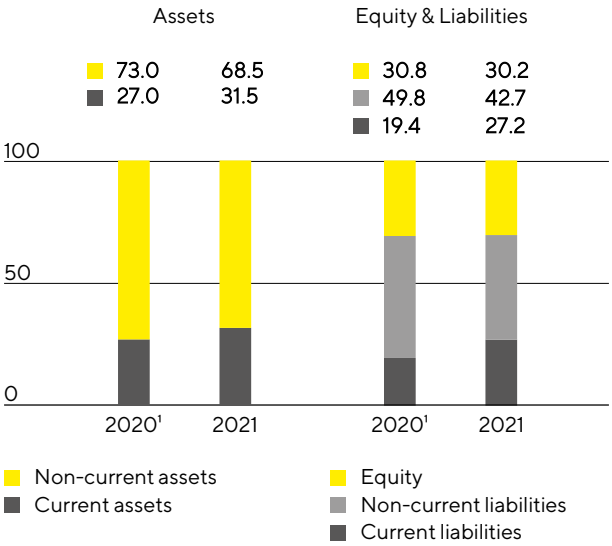
Key Figures for Working Capital

in days		2021	2020[3]
Days inventory outstanding			
Inventories | Sales revenue[1]	x 360	93	83
Days sales outstanding			
Trade receivables | Sales revenue[1]	x 360	44	47
Days payables outstanding			
Trade payables | Sales revenue[1]	x 360	54	49
Net working capital days			
Net working capital[2] | Sales revenue[1]	x 360	83	81

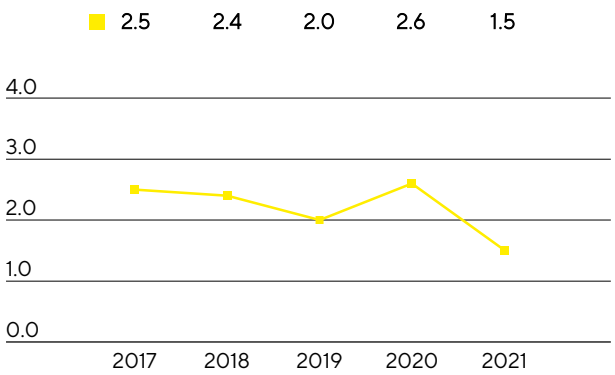
1 Including pro forma sales of recent acquisitions
2 Sum of inventories and trade receivables less the trade payables
3 The figures for the reporting period 2020 were restated due to the finalization of the purchase price allocation for the acquisitions of BIA Separations and WaterSep BioSeparations

Equity grew by €339.9 million to €1,720.2 million as of year-end. The equity ratio was 30.2% (previous year: 30.8%). In the reporting year, current and non-current liabilities for the Sartorius Group of €3,977.7 million were higher than the previous year's figure of €3,104.4 million, which was due to growth.

Balance Sheet Structure
in %



Ratio of Net Debt to Underlying EBITDA[2]



1 The figures for the 2020 reporting period were restated due to the finalization of the purchase price allocation for the acquisitions of BIA Separations and WaterSep BioSeparations
2 Quotient of net debt and underlying EBITDA over the past 12 months, including the pro forma amount contributed by acquisitions for this period

At the end of fiscal 2021, gross debt stood at €2,075.5 million relative to €2,087.4 million in fiscal 2020 and is comprised of liabilities to banks, including note loans ("Schuldscheindarlehen"), as well as lease liabilities. Due to significantly increased credit balances at banks, net debt decreased from €1,883.9 million a year earlier to €1,732.7 million in the reporting year.

In relation to the debt financing capacity of the Sartorius Group, the ratio of net debt to underlying EBITDA is a key metric. It is defined as the quotient of net debt and underlying EBITDA over the past 12 months, including the pro forma amount contributed by acquisitions for this period. This ratio was 1.5 as of December 31, 2021, down from 2.6 in the prior year, predominantly as a result of the substantial increase in earnings and despite substantial investments as well as the acquisitions made in the reporting year, and was thus below the ratio last forecasted (slightly below 2.0).

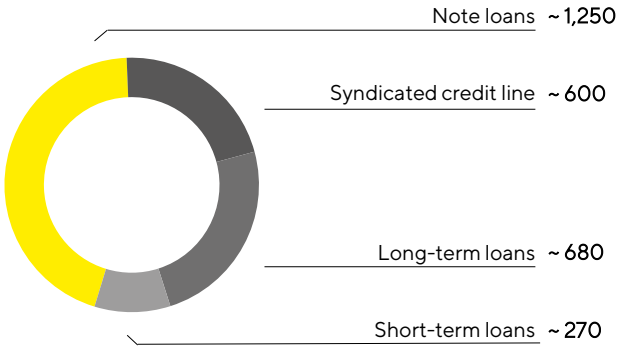
Reconciliation

€ in millions	2021	2020
Gross debt	2,075.5	2,087.4
- Cash & cash equivalents	342.8	203.4
Net debt	1,732.7	1,883.9
Underlying EBITDA (12 months)	1,175.0	692.2
+ Pro forma EBITDA from acquisitions (12 months)	6.1	25.4
Pro forma underlying EBITDA	1,181.1	717.6
Ratio of net debt to underlying EBITDA	1.5	2.6

Financing | Treasury

Sartorius covers its operational and strategic financing needs through a combination of operating cash flows and the assumption of short-, medium- and long-term financial liabilities. The major debt financing instruments are shown in the graphic below.

Main Financing Instruments
€ in millions

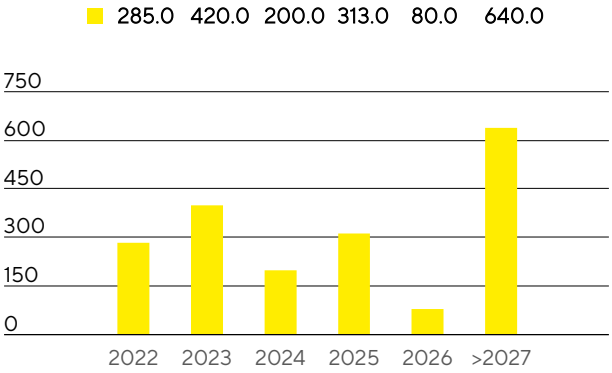


A major pillar in our financing mix is a syndicated credit line of €600 million with a term up to 2024 and an extension option. In addition, Sartorius has diverse short-term credit lines totaling around €270 million. As of December 31, 2021, the total volume of all available credit lines amounted to €870 million of which around €33 million was used. Thus, the available credit lines unused as of the end of 2021 was €837 million.

Besides these credit lines, Sartorius placed several note loans ("Schuldscheindarlehen") with a total aggregate volume outstanding of around €1,250 million at year-end. In addition, the company has several long-term loans in place that total around €680 million and are being used in part for the expansion of production capacities.

The financing instruments mentioned above comprise those with both fixed and variable interest rates. The maturity profile of the Group's financing instruments is broadly and appropriately diversified.

Maturity Profile of the Financing Facilities[1]
€ in millions



1 As of December 31, 2021, major financing instruments

Due to its global business activities, Sartorius is exposed to the usual fluctuations in foreign exchange rates, which it partially hedges by forward contracts. At the end of 2021, foreign exchange contracts amounted to €519 million on a reported basis, with a market value of -€9.9 million.

Business Development of Bioprocess Solutions

Exceptionally strong sales growth and jump in profitability

Dynamic development of core business; additional pandemic-related momentum and positive development of acquisitions

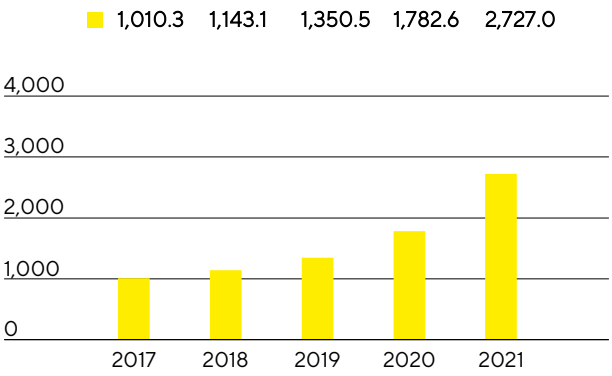
Strong gains across all product categories and regions

Division sales	Order intake	Underlying EBITDA margin
€2,727.0m	€3,483.5m	36.2%
In constant FX: +54.7%	In constant FX: +57.6%	+3.9 percentage points

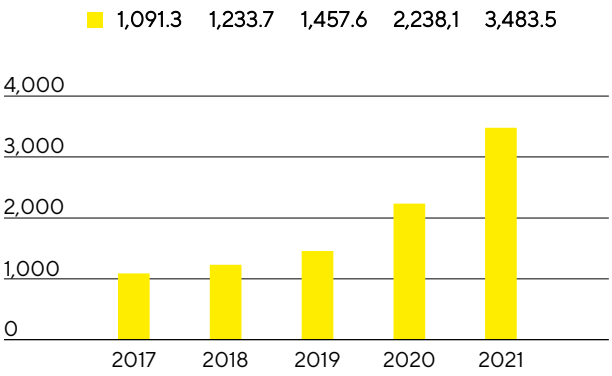
Sales Revenue and Order Intake

In the reporting year, the Bioprocess Solutions Division grew at an exceptionally strong rate by 54.7% to €2,727.0 million in constant currencies (reported: +53.0%) after it had already expanded by more than a third in the previous year. As a result, the division's performance exceeded the forecast that had projected sales growth of 22% to 28% at the beginning of the reporting year and had been raised in July 2021 to a sales increase of 50%. In particular, business with manufacturers of biopharmaceutical medications performed very well across all product areas and regions. Beyond this, pandemic-related demand, essentially due to coronavirus vaccine production ramped up and extended by some customers, added close to 20 percentage points to sales expansion. The major part of this growth was achieved organically, supported by production capacities expanded at several sites and by overall stable, yet strained supply chains. The most recent acquisitions also saw positive development, contributing close to 5 percentage points to revenue growth.

Sales Revenue 2017 to 2021
€ in millions



Order Intake 2017 to 2021
€ in millions



Sales Revenue and Order Intake

€ in millions	2021	2020	in % reported	in % cc
Sales revenue	2,727.0	1,782.6	53.0	54.7
Order intake	3,483.5	2,238.1	55.6	57.6

In 2021, the Bioprocess Solutions Division increased its sales revenues in all business geographies. EMEA, the region generating the highest share of around 41% to total revenue, saw an especially steep increase, with sales soaring 61.8% to €1,130.5 million, bolstered by particularly robust business with vaccine manufacturers. Accounting for around 34% of division sales, the Americas region reported growth of 45.1% to €913.1 million. The Asia | Pacific region also showed very strong growth, with sales up 57.7% to €683.5 million, contributing a share of 25% to division revenue.

Order intake developed even more strongly than sales revenue, surging by 57.6% in constant currencies (reported: +55.6%) to €3,483.5 million, with pandemic effects accounting for around 15 percentage points and acquisitions for 7 percentage points. While order intake was significantly above sales revenue up into the third quarter, also because some customers in the current situation placed their orders further in advance than usual, the ratio of order intake to sales revenue normalized during the second half of the year and was at the level of the company's long-term average toward the end of the year.

Sales by Region

€ in millions	2021	2020	in % reported	in % cc
EMEA	1,130.5	698.5	61.9	61.8
Americas	913.1	651.3	40.2	45.1
Asia	Pacific	683.5	432.9	57.9	57.7

Overproportionate Increase in Earnings

Underlying EBITDA of the Bioprocess Solutions Division increased at a significantly overproportionate rate in relation to sales revenue, growing by 71.3% to €986.3 million. The division's respective margin rose year over year to 36.2% (previous year: 32.3%) and thus slightly exceeded the forecast that had projected around 33% at the beginning of the year and had last been updated in July 2021 to around 36.0%. Besides being attributed to economics of scale, the increase in profitability is also due to a cost base that rose only slowly in some areas. This trend subsided due to the intensified buildup of the workforce in the second half of the reporting year, as well as to rising costs in logistics and purchasing. Currency effects as well as the most recent acquisitions did not have any material impact on the development of the division's earnings margin.

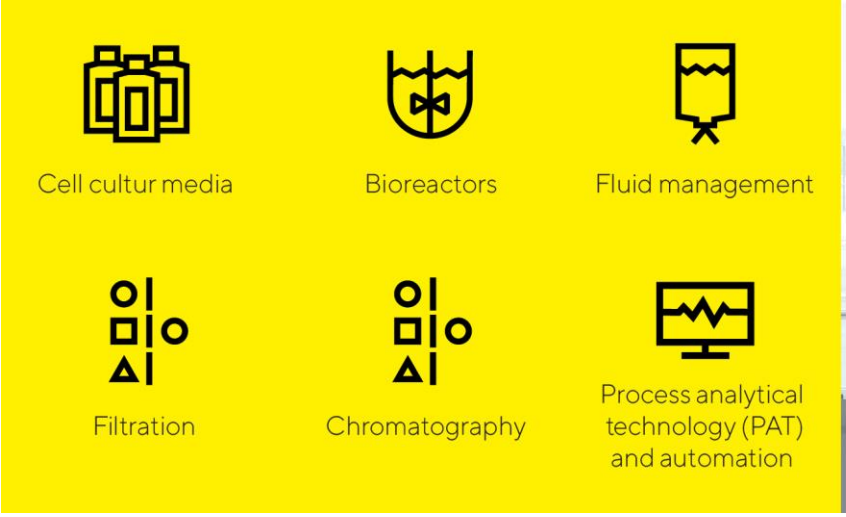
Underlying EBITDA and EBITDA Margin

	2021	2020
Underlying EBITDA in millions of €	986.3	575.9
Underlying EBITDA margin in %	36.2	32.3

In the year under review, the Bioprocess Solutions Division recorded extraordinary items of -€32.1 million relative to -€36.2 million a year earlier. These items predominantly consisted of expenses in connection with the most recent acquisitions as well as for various cross-divisional projects and rebranding.

Products and Sales

The Bioprocess Solutions Division markets products and services for the entire added-value chain in biopharmaceutical production and preceding process development. The division's portfolio includes cell lines, cell culture media, bioreactors, a wide range of products for separation, purification and concentration, and products and systems for storage and transportation of intermediate and finished biological products.



Sartorius expanded the product portfolio of its Bioprocess Solutions Division for manufacturing cell and gene therapeutics by two acquisitions:

- CellGenix produces critically essential cell culture components, such as growth factors, cytokines and media in GMP quality, for manufacturing cell and gene therapy products
- The cell culture specialist Xell develops and produces media and feed supplements for cell cultures, especially for manufacturing viral vectors that are used in gene therapeutics and vaccines

Beyond these acquisitions, the Bioprocess Solutions Division has been collaborating with Waters Corporation since the reporting year. As part of this collaboration, a Waters bioprocess analyzer based on mass spectroscopy will be combined with the Sartorius multi-parallel bioreactor system, enabling specific analytical steps during drug discovery and cell line development to be performed directly in the production environment, i.e., at-line measurements, so these steps do not have to be outsourced to external laboratories for sample testing, the usual procedure until now. This solution greatly accelerates the timeline for process development for the benefit of users.

In addition, Sartorius launched on the market new software versions for design of experiments (DoE) and for multivariate data analysis, which accelerate development and optimization of processes and enhance evaluation of complex datasets generated across the biopharmaceutical production process, respectively.

Sales Activities

The Bioprocess Solutions Division markets its product portfolio directly. Sales activities for key accounts are coordinated and supported by global key account management.

In the reporting year, many direct customer contacts were enabled through the use of digital communication tools, even after pandemic-mandated travel and distancing restrictions were eased. Videoconferencing and augmented reality continue to be increasingly used for direct interaction, such as for product demonstration, training and commissioning. To strengthen the sales organization, the division is concentrating on expanding its international presence, especially by more recruitment. A further focus is on the ongoing enhancement of sales effectiveness, for example, by specialized training for employees.

Product Development

Development activities at Sartorius essentially focus on technology areas such as membranes, which are the core component of our filter products; various technology platforms such as single-use containers for fluid management in biopharmaceutical processes and sensors; and control technologies for processes such as fermentation and cell cultivation. Additional focal areas entail developments in materials and components that include plastics, elastomers and intelligent polymers; expanded data analysis; and cell line development.

Our largest site for product development is in Göttingen, Germany. Further key activities take place in France, Germany, India, the USA, the U.K., and Sweden, as well as in Israel and Slovenia.

Production and Supply Chain Management

Bioprocess Solutions has a very well-developed global production network that was expanded at many sites in the reporting year. The largest production facilities are located in Germany, France and Puerto Rico. Beyond these locations, this division also manufactures in the U.K., Switzerland, Tunisia, India, the United States, China, Israel, and in Slovenia. Additional sites in Germany have been added by the most recent acquisitions.

Despite the restrictions in worldwide logistics as a result of the coronavirus pandemic, the company's supply chains proved to be strained, yet mostly stable. A few preliminary products, raw materials, components and services took longer to deliver or their availability was temporarily limited. This was reflected in some cases by correspondingly extended delivery times for our own products.

Sartorius expanded its production in all regions due to high demand in its core business and to additional customer needs related to coronavirus vaccines and Covid-19 therapeutics. On top of this, the company increasingly hired additional production staff and has been manufacturing at a few sites around the clock seven days a week.

Sartorius started up operations at a new Customer Interaction Center (CIC) in China for biopharmaceutical customers. The CIC enables customers to test complex systems at our site first before these are delivered to and set up at their plant facilities. A significantly expanded application, validation and service center was opened at the company site in Shanghai, and a customer test laboratory in Havant, U.K. Production facilities were also expanded in Israel and Slovenia.

Business Development of Lab Products & Services

Significant increase in sales revenue and earnings compared to prior-year development dampened by the pandemic

Strong organic growth; bioanalytics business especially dynamic

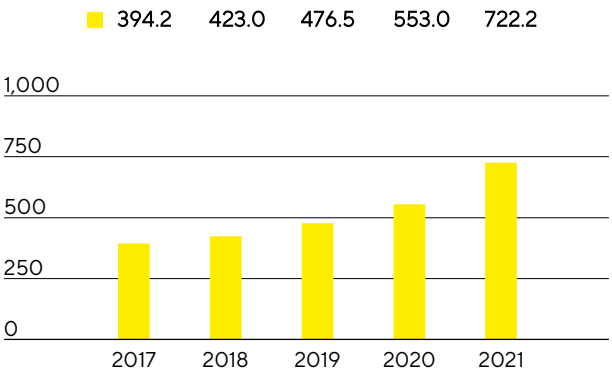
Excellent performance of the previous year's acquisition

Division sales	Order intake	Underlying EBITDA margin
€722.2m	€784.4m	26.1%
In constant FX: +32.0%	In constant FX: +32.6%	+5.1 percentage points

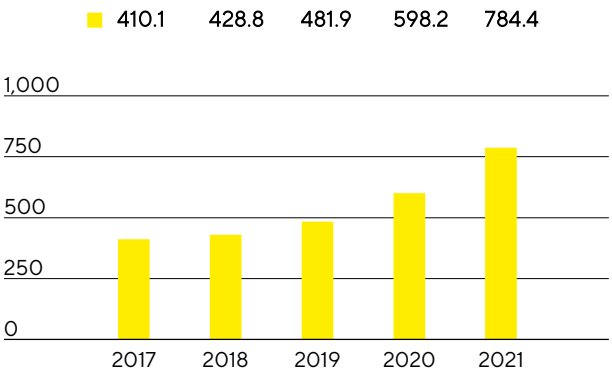
Sales Revenue and Order Intake

The Lab Products & Services Division saw strong sales revenue growth, recording an increase of 32.0% in constant currencies to €722.2 million (reported: +30.6%), compared to the prior-year period dampened by the pandemic. The division thus exceeded its forecast, which projected a sales increase of 10% to 16% at the beginning of the year and was last raised in July 2021 to 30%. The major part of this growth was organic, with components used in coronavirus test kits accounting for around 6 percentage points. Acquisitions contributed about 6 percentage points to the division's sales revenue growth. Performance was especially dynamic for business with bioanalytical instruments, which life science customers use to develop medications and cell lines.

Sales Revenue 2017 to 2021
€ in millions



Order Intake 2017 to 2021
€ in millions



Sales Revenue and Order Intake

€ in millions	2021	2020	in % reported	in % cc
Sales revenue	722.2	553.0	30.6	32.0
Order intake	784.4	598.2	31.1	32.6

In EMEA, the region contributing the highest share of revenue of around 39%, the division achieved sales revenue of €280.5 million, which equates to a significant increase of 18.3% compared with the previous year. Sales grew very strongly in the Americas region, whose share of division revenue was around 32%, by 47.2% to €228.2 million. This expansion was substantially influenced by acquisitions and the fast-growing bioanalytics business. The Asia | Pacific region, which accounted for around 29% of the Lab Products & Services Division's business, expanded by 37.3% to €213.5 million, compared to a prior-year revenue base that was relatively moderate due to the pandemic.

Order intake also developed very dynamically, rising 32.6% in constant currencies (reported: +31.1%) to €784.4 million.

Sales by Region

€ in millions	2021	2020	in % reported	in % cc
EMEA	280.5	236.6	18.6	18.3
Americas	228.2	160.9	41.8	47.2
Asia	Pacific	213.5	155.5	37.3	37.3

Earnings

In the reporting year, the Lab Products & Services Division significantly increased its underlying EBITDA by 62.3% to €188.8 million. The corresponding margin reached 26.1% (previous year: 21.0%) and was thus markedly above the margin of around 23% projected at the beginning of the reporting year and in line with the forecast last raised in July 2021 to around 26.0%. This strong increase in profitability was due, in particular, to economies of scale as well as a favorable product mix based on the strong growth of the bioanalytics business. In addition, the margin was positively influenced by partially deferred cost development in some areas due to the pandemic. This trend subsided due to the intensified buildup in the workforce in the second half of the reporting year, as well as to rising costs in logistics and purchasing. A positive effect resulted from the acquisition of the Octet business in the area of bioanalytics, which was made in fiscal 2020, while exchange rates did not have any material impact on the division's earnings margin.

Underlying EBITDA and EBITDA Margin

	2021	2020
Underlying EBITDA in millions of €	188.8	116.3
Underlying EBITDA margin in %	26.1	21.0

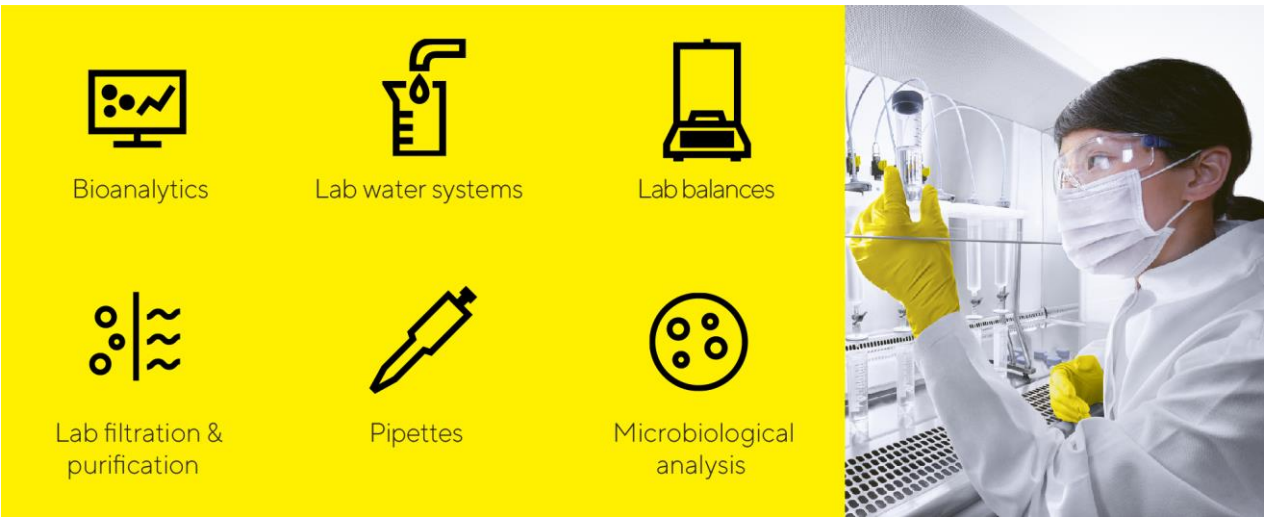
The Lab Products & Services Division recorded extraordinary items of –€8.7 million in the reporting year relative to –€21.5 million a year ago. These were predominantly related to the most recent acquisitions as well as to expenses for various cross-divisional projects and rebranding.

Products and Sales

The Lab Products & Services Division focuses with its products on research laboratories in the pharmaceutical and biopharmaceutical industries as well as on academic research institutes.

In the area of bioanalytics, the division offers life science customers innovative systems for cell analysis. These greatly accelerate the otherwise time-intensive discovery of medical drug candidates by automating and digitalizing core steps in analysis. Sartorius expanded its bioanalytics portfolio by acquiring a majority stake in ALS Automated Lab Solutions on January 3, 2022. This laboratory technology company develops, manufactures, and markets solutions for automated analysis, selection, and isolation of cells. Moreover, in the reporting year, Sartorius introduced smaller versions of its market-leading systems for label-free real-time analysis of biomolecular interactions and thus expanded its product range in this area. Based on a patented technology, these systems help customers in the biopharmaceutical industry to increase the efficiency of essential steps in the development of molecules, cell lines, and processes. With the new versions of these analytical systems, the division now also addresses the needs of academic research institutes and biotech startups that tend to examine relatively small volumes yet, at the same time, do not wish to compromise on functionality or performance capability.

Beyond this, the product range of the Lab Products & Services Division includes a broad array of premium laboratory instruments for sample preparation, such as laboratory balances, pipettes and lab water systems, as well as lab consumables, such as filters and microbiological test kits. This Sartorius portfolio is tailored to the biopharmaceutical industry and additionally focuses on research and quality control labs in the chemical and food industries. The division expanded its product array by launching new vacuum filtration systems and dosing stations for lab water.



The services offered by the Lab Products & Services Division cover the entire life cycle of laboratory instruments, from device installation and commissioning to validation, calibration, verification and regular maintenance to repair. These services are not limited to Sartorius instruments alone; they are offered to a partial extent for devices from other manufacturers as well. This extensive range enables our customers to minimize the number of service providers they use and to reduce complexity and costs.

Beyond this, Sartorius application laboratories in all regions offer customers the opportunity to test Sartorius products, even using their own samples, and to take training courses.

Sales Activities

The division sells its products directly and through laboratory distributors, focusing on direct sales that is continuously being expanded along with the company's increasing alignment with the needs of life science customers. In aligning its activities, the division is increasing using digital channels. Expansion of its e-commerce activities in the reporting year enhanced the availability and ordering process of products for our customers, among other features offering greater convenience

Besides extending sales structures, the company also concentrates on the ongoing enhancement of sales efficiency, in part through the creation of synergies between the two divisions. The Lab Products & Service Division therefore gains access to customers of the Bioprocess Solutions Division, and the latter can likewise tap into new sales opportunities in return. In the reporting year, the sales teams of both divisions received cross-divisional training to better identify the needs of customers for the products of the respective other division.

Product Development

The division has extensive technological expertise in the areas of bioanalytics, laboratory instruments and laboratory consumables. Software and hardware advancements in our cell analysis products create many new evaluation opportunities for our customers. They are the foundation for the development of new tools capable of processing and visualizing vast quantities of data appropriately based on specific applications. We expect that such software solutions will become increasingly important.

Compliance with regulatory requirements is critical for our customers. Product development priorities for Sartorius therefore include data management, connectivity and process automation.

Most of the research and development for the Lab Products & Services Division is conducted at Group headquarters in Göttingen, Germany, but Sartorius also carries out R&D activities at its sites in Finland and the U.K. as well as in the USA.

Production and Supply Chain Management

The Lab Products & Services Division operates plants in Germany, China, Finland, the U.K. and the USA. These plants serve as centers of competence and tend to focus on one product group or a small set of product groups. In the reporting year, for example, laboratory balances were manufactured in Germany and China, pipettes in Finland, and bioanalytical systems in the USA and China. Microbiological test kits are produced in the U.K. and most membrane-based products in Germany.

Despite the restrictions in global logistics as a result of the coronavirus pandemic, supply chains proved to be strained, but largely stable. Due to high demand, also generated by the coronavirus pandemic, manufacturing operations were expanded at some of the division's plants.

Assessment of Economic Position

In 2021, Sartorius grew at an exceptionally dynamic rate and, again, significantly more sharply than in the already strong previous year. The main growth driver was once again the high demand for innovative products and technologies for the development and production of biopharmaceuticals. The need for products required for coronavirus vaccines and test kits added significant momentum, but did not play a dominant role. Moreover, the company's most recent acquisitions delivered positive performance and, in the Lab Products & Service Division, the dynamically growing bioanalytics business contributed to the strong increase in sales revenue and earnings.

The start to the reporting year was already very positive so that Sartorius substantially raised its forecast for both divisions and the entire Group in March 2021. The high pace of growth also continued on into the second quarter based on high order intake and, therefore, management significantly raised the sales revenue and profitability targets at the end of the first half of the year. The company also sustained its strong business performance in the second half of the year, with rates of increase slightly lower than those in 2020 due to the high prior-year basis of comparison.

Consolidated sales revenue rose in 2021 by 49.3% in constant currencies to €3,449.2 million. The Group's earnings margin, measured on the basis of underlying EBITDA, climbed to 34.1%. The Bioprocess Solutions Division grew its sales revenue by 54.7% in constant currencies to 2,727.0 million and reached an underlying EBITDA margin of 36.2%. The Lab Products & Services Division increased its sales revenue by 32.0% in constant currencies to €722.2 million at an earnings margin of 26.1%. As a result, both divisions as well as the Sartorius Group exceeded the forecast last raised in July 2021.

The ratio of net debt to underlying EBITDA for the last twelve months was 1.5 as of December 31, 2021, slightly below the forecasted figure of 2.0 due to strong net cash flow and the increase in earnings. The Sartorius Group continues to have significant financing flexibility to implement its strategy.

In the context of its ambitious growth targets, Sartorius has been continuously investing in the expansion of its manufacturing capacities and in its digital infrastructure over the past few years. In 2021, some expansion projects were moved ahead of schedule and extended due to the company's exceptionally strong growth. Despite these measures, the ratio of capital expenditures (CAPEX) to sales revenue remained at 11.8%, lower than the forecast released at the beginning of the reporting year as well as slightly below the last updated guidance of about 12%.

Projected | Actual Comparison for the Year 2021

	Actual 2020	Guidance January 2021	Guidance March 2021	Guidance July 2021	Actual 2021
Sartorius Group					
Sales growth[1]	30.2%	~19% - 25%	~35%	~45%	49.3%
Underlying EBITDA margin in %	29.6%	~30.5%	~32%	~34%	34.1%
Net debt to underlying EBITDA	2.6	slightly below 2.5[2]	~2.0[2]	slightly below 2.0[2]	1.5
CAPEX ratio	10.3%	~15%	~14%	~12%	11.8%
Sartorius Divisions					
Bioprocess Solutions					
Sales growth[1]	34.4%	~22% - 28%	~40%	~50%	54.7%
Underlying EBITDA margin in %	32.3%	~33%	~34%	~36%	36.2%
Lab Products & Services					
Sales growth[1]	18.1%	~10% - 16%	~20%	~30%	32.0%
Underlying EBITDA margin in %	21.0%	~23.0%	~24%	~26%	26.1%

1 In constant currencies
2 Possible acquisitions are not considered

Annual Financial Statements of Sartorius AG

The retained profit of Sartorius AG is the key reference value for the payment of dividends to our shareholders. Whereas the Sartorius Group financial statements are drawn up according to the International Financial Reporting Standards (IFRS), the annual financial statements for Sartorius AG are prepared by applying the rules and regulations of the German Commercial Code (HGB).

The Management Report of Sartorius AG and the Group Management Report for fiscal 2021 are combined. The HGB annual financial statements of Sartorius AG and the combined management report are published simultaneously in the German Federal Gazette (Bundesanzeiger).

Business Operations, Corporate Strategy, Corporate Management and Oversight, Overview of Business Development

Sartorius AG has exercised only the functions of the strategic, group-leading management holding entity for the Sartorius Group since the beginning of fiscal 2011, and we refer in this connection to the explanatory reports concerning business operations, corporate strategy, corporate management and oversight, as well as the overview of business development, presented on pages 24 et seq. of the combined management report of Sartorius AG and the Group.

Earnings Situation

Sales revenue of Sartorius AG essentially consists of cost transfers to affiliated companies within the Group for management services rendered as well as of the rental of buildings on Sartorius Campus.

In the prior reporting year, other operating income consisted of book profits from asset sales in the amount of €131.0 million. These resulted from the sale of shares of Sartorius Stedim Biotech as part of the acquisition of BIA Separations.

Income from investments of €46.3 million relative to €23.3 million a year ago concerns dividends paid out for the French subsidiary Sartorius Stedim Biotech S.A.

Due to profit and loss transfer agreements, Sartorius AG received a profit of €16.1 million from Sartorius Corporate Administration GmbH (2020: €4.2 million). Moreover, Sartorius Lab Holding GmbH transferred a loss of €2.5 million (2020: loss of €28.4 million). The high loss reported by Sartorius Lab Holding GmbH essentially resulted from its one-time assumption of losses recorded by Sartorius Lab Instruments GmbH & Co. KG for fiscal 2020.

Net Worth and Financial Position

The balance sheet total of Sartorius AG decreased in the reporting year by €18.3 million to €2,357.7 million.

The balance sheet structure of Sartorius AG reflects its function as the management holding entity for the Sartorius Group. Fixed assets consist essentially of financial assets and, in the reporting year, stood at €2,226.8 million (2020: €2,230.3 million). Accordingly, fixed assets accounted for 94.4% of the balance sheet total (2020: 93.9%). The equity ratio for fiscal 2021 was 14.2% relative to 14.4% in 2020.

Financing of the Sartorius Group is done centrally through Sartorius AG. Internal Group financing is provided by granting corresponding short-term and long-term loans. The long-term loans are reported in financial assets as loans to affiliated companies and remained unchanged with respect to the prior reporting year at €1,658.9 million.

Statement of Profit and Loss of Sartorius AG
Based on the total cost accounting method according to Section 275, Subsection 2, of HGB[1]

€ in K	2021	2020
1. Sales revenue	16,302	17,147
2. Other operating income	1,420	136,582
3. Employee benefits expense	-8,650	-7,601
4. Depreciation and amortization	-9,438	-6,774
5. Other operating expenses	-14,932	-13,580
6. Income from investments	46,270	23,273
7. Profit received under a profit and loss transfer agreement	16,103	4,210
8. Loss accepted under a profit and loss transfer agreement	-2,504	-28,448
9. Interest and similar income	17,889	12,950
10. Interest and similar expenses	-23,037	-21,025
11. Income tax expense	1,138	-3,827
12. Profit after tax	40,561	112,907
13. Other taxes	-88	-24
14. Net profit for the period	40,473	112,883
15. Profit brought forward	158,014	93,364
16. Retained profits incl. net profit for the period	198,487	206,247

Balance Sheet of Sartorius AG
According to HGB [1], € in K

Assets	Dec. 31, 2021	Dec. 31, 2020
A. Fixed Assets		
I. Intangible assets	18,495	24,044
II. Property, plant and equipment	105,780	107,341
III. Financial assets	2,102,558	2,098,883
	2,226,833	2,230,268
B. Current Assets		
I. Trade and other receivables	113,562	61,628
II. Cash on hand, deposits in banks	14,499	80,495
	128,061	142,123
C. Prepaid Expenses	2,809	3,644
	2,357,703	2,376,035

Equity and Liabilities	Dec. 31, 2021	Dec. 31, 2020
A. Equity		
I. Subscribed capital	74,880	74,880
Nominal value of treasury shares	-6,464	-6,464
Issued capital	68,416	68,416
II. Capital reserves	57,715	56,396
III. Earnings reserves	10,867	10,867
IV. Retained profits incl. net profit for the period	198,487	206,247
	335,485	341,926
B. Provisions	37,383	38,447
C. Liabilities	1,984,835	1,995,662
	2,357,703	2,376,035

1 HGB = German Commercial Code

Proposal for Appropriation of Profits

The Executive Board and the Supervisory Board will submit a proposal to the Annual Shareholders' Meeting to appropriate the retained profit of €198,487,285.16 reported by Sartorius AG for the year ended December 31, 2021, as follows:

in €	
Payment of a dividend of €1.25 per ordinary share	42,782,511.25
Payment of a dividend of €1.26 per preference share	43,079,214.78
Unappropriated profit carried forward	112,625,559.13
	198,487,285.16

Research and Development

Detailed information about the research and development activities of the Sartorius Group and of its divisions is given on pages 33, 58 and 63.

Employees

Sartorius AG as a holding company does not employ any staff to be disclosed pursuant to Section 285, No. 7, of HGB.

Risks and Opportunities

The opportunities and risks affecting the business development of Sartorius AG as the management holding entity are essentially equivalent to those of the Sartorius Group. Sartorius AG shares in the risks to which its investments and subsidiaries are exposed in proportion to the extent of its investment. Where expedient and feasible, we adopted countermeasures and | or arranged for balance sheet measures during the reporting year to cover all discernible risks within Sartorius AG that had the potential to negatively impact our net worth, financial position and profitability.

A detailed Opportunity and Risk Report for the Sartorius Group is provided on pages 70 to 81; a description of the internal control and risk management system, on page 87.

Forecast Report

Earnings trends for Sartorius AG depend substantially on the progress of its subsidiaries and, hence, on the Sartorius Group.

For the individual financial statements of Sartorius AG, a slightly higher annual profit is forecasted due to the expected increase in the dividend income of Sartorius Stedim Biotech S.A.

The development of the Sartorius Group's business is discussed in the Forecast Report on pages 82 to 86.

Opportunity and Risk Report

Principles

Every business activity entails opportunities and risks, which have to be managed. The skill with which this is done is a decisive success factor in determining the future development of a company's shareholder value.

The point of risk management is not to always eliminate every risk possible; rather, our approach is to intentionally take a certain measure of risk in our business activities in order to be successful in unlocking opportunities. In this endeavor, it is important to keep risks contained within acceptable limits and to control them carefully. Through appropriate guidelines, we ensure that risk assessments are taken into account in the decision-making processes from the very beginning.

At Sartorius, identification and management of opportunities and risks is a cross-functional component of Group management. To this extent, our risk management organization reflects a global functional organization in the two divisions of Bioprocess Solutions and Lab Products & Services. Individuals heading a functional area in a division in the Group companies are each responsible for their own management of opportunities and risks. The cross-divisional Finance & Controlling department is responsible for the organization of the respective reporting process, including the further development of the Group's risk management system.

Managing Opportunities

Our opportunity management centers on the analysis of target markets and sector environments, as well as the assessment of trends, both of which give strong indications as to future business opportunities. The identification of the potential for development is one of the key roles of the relevant managers and initially takes place at the local rather than the central level. Particularly the market-facing functions, such as strategic marketing and product management in each of the two divisions, play a leading role in this respect. These areas are supported by the central Business Development unit with market monitoring, data analysis and the implementation of strategic projects.

We regularly review the Group's strategy and revise it as necessary. As part of these reviews, the members of the Executive Board regularly discuss short-, medium- and long-term opportunity potential for the various business areas with the managers having operational responsibility. If the opportunities are short-term in nature, they are considered in annual budget planning. Medium- and longer-term opportunities are tracked systematically as part of strategic planning.

As a partner to the biopharmaceutical and laboratory industries, Sartorius operates in future-oriented and high-growth sectors. The significant opportunities generated by the various market and technology trends are described in detail in the sections entitled "Sector Conditions" and "Outlook for the Sectors" on pages 35 and 83, respectively.

Our assessments rank Sartorius as one of the global market leaders in many subsegments and product areas. We believe the high quality of our products, our strong brand recognition and our established customer relationships give us a good chance to stabilize and continue extending our market leadership. The corresponding division strategies and the growth opportunities and initiatives based on them are discussed in the section on the strategy of the Bioprocess Solutions Division, which begins on page 28, and in the section on the strategy of the Lab Products & Services Division, which starts on page 29.

Risk Management

Organization

Overall responsibility for the maintenance of an effective risk management system ensuring comprehensive and consistent management of all material risks rests with the Executive Board. Coordinating and developing this system and combined risk reporting are the responsibilities of the Finance & Controlling department, while the particular functional areas are responsible for identifying and reporting individual risks, as well as for assessing their potential impact and for taking the appropriate countermeasures.

The Supervisory Board of Sartorius AG monitors the effectiveness of the risk management system, with the preparatory work being performed by the Audit Committee of this board. While carrying out their statutory audit mandate for the annual financial statements and consolidated financial statements, the independent auditors assess whether the early warning system in place is capable of prompt identification of risks that could jeopardize the future of the company. Finally, the Internal Audit Department regularly reviews the risk management process and system.

Insurance

We have taken out insurance policies to cover a wide range of risks where possible and economically advisable. These insurance policies include coverage against product liability, property damage, business interruption, transport, material and pecuniary damages and other risks, and provide comprehensive coverage for legal costs. An independent department working in conjunction with an external insurance broker regularly reviews the nature and extent of our insurance protection and makes any adjustments as necessary.

When choosing our insurers, we particularly consider the credit rating of these entities as potential contractual partners, as well as aim to achieve a high degree of diversity in order to mitigate the related risks.

Risk Management System and Risk Reporting

The risk management system of the Sartorius Group is documented in a Risk Management Handbook that applies throughout the entire Group and includes definitions of the framework, the structural organization, processes, risk reporting and monitoring and controls of the effectiveness of the risk management system. This Handbook is based as a whole on the ISO 31000 "Risk management – Guidelines" standard and the COSO standard (COSO = Committee of Sponsoring Organizations of the Treadway Commission). There are also a number of other sources that contain stipulations for handling risks, including the articles of association and rules of procedure of the Group companies and other guidelines. The strong growth of the Group over the past years and the rising demands of customers and regulators meanwhile require that we continue to adapt our guidelines and rules.

The prescribed reporting process in the risk categories subsequently described establishes the rules for the ongoing review of and information on risk situations. If any specific risks are discernible, these are documented with respect to their assessment, probability of occurrence and measures to be taken to eliminate such risks or to mitigate their impact. As a matter of policy, assessment of risks is governed by the remaining net risk, i.e., after any risk-mitigating action has been taken. In addition, as soon as these risks reach defined size criteria, they are reported to the central risk management system. The central risk management system aggregates the risk reports and provides regular reports to the Executive Board and the Supervisory Board on the risk situation of the Group. Since fiscal year 2021, regular reporting also includes the Group's risk-bearing capacity

as determined on the basis of rolling liquidity planning. We have an urgent reporting procedure in place to ensure that when a new or emerging significant risk to our net worth, financial position and profitability is identified, the Executive Board of Sartorius AG receives all of the necessary details without delay.

In order to provide a logical structure, we defined four main risk categories: external risks, operating risks, financial risks and compliance risks. Each main category is divided into several subcategories that are described in the following sections.

Moreover, we have defined a so-called risk matrix that categorizes the probability of occurrence and potential impact on the net profit into specific classes as follows:

Probability of Occurrence	
Remote	< 10%
Possible	10% - 50%
Probable	50% – 75%
Very likely	> 75%

Significance	
in millions of €	Impact on Earnings
Insignificant	< 10
Moderate	10 – 50
Significant	50 – 100
Critical	> 100

These two elements are combined to form the following matrix that indicates the importance of the individual risks for the Group:

> 75%	Low	Medium	High	High
50% – 75%	Low	Medium	Medium	High
10% – 50%	Low	Medium	Medium	Medium
< 10%	Low	Low	Medium	Medium
Probability of occurrence | Impact	< €10 million	€10 – €50 million	€50 – €100 million	> €100 million

External Risks

General Risks

In principle, our ability to foresee and mitigate the direct and indirect effects of risks entailed by life in general is limited. Such risks include natural catastrophes, pandemics or force majeure, and their associated damage to commercially significant and critical infrastructure and currency or monetary crises. Yet we proactively take measures, whenever feasible, to ensure that we can respond appropriately and at short notice or are insured against any damage entailed by such risks.

The coronavirus pandemic and the extensive measures to contain it led to a global recession in 2020. The global economy was largely able to recover from this during the reporting year, although the upturn has not extended evenly to all regions and sectors and has to some extent been curbed by supply chain problems and

prices of raw materials. The pharma and biotech industry, which is almost independent of economic fluctuations, developed robustly overall in this environment. The sector also played a key role in managing the crisis as a result of its role in developing and manufacturing vaccines and therapeutics, and certain manufacturers invested significantly in building up corresponding production capacity. As one of the leading bioprocess technology providers, Sartorius benefited from this development and reported additional revenue again in the reporting year, particularly in connection with the development and production of coronavirus vaccines and test procedures.

Travel and contact restrictions due to the pandemic continue to impact direct sales in 2021. The changing requirements for interaction with customers were met, among other things, by increasing the use of video conferencing and other digital communication tools, including augmented reality. Supply chains have proven to be largely stable despite the restrictions on global logistics. However, our lead times for certain products have increased due to the fraught supply situation for some of the components and services we need to procure.

We currently expect the additional demand arising from the coronavirus pandemic to continue for some time as a result of the need for booster shots and the expansion of vaccination campaigns to countries that previously had little access to vaccines. As the coronavirus pandemic persists, negative consequences for the future cannot be ruled out. However, it should be noted that the sector's focus on vaccines and therapeutics for the coronavirus will be at the expense of other customer projects and that the pandemic-related postponement of studies for other indications also has an adverse effect on the course of our business.

Our largest sites in Germany and France do not face any major risks from natural catastrophes, while, for example, our production plants in Puerto Rico and in Fremont, California, are exposed to the risks of severe hurricanes or earthquakes and could be impacted accordingly. We endeavor to counteract this risk by applying the highest possible safety standards to the buildings and explicitly consider this risk in our warehousing and international production network strategies.

Furthermore, political developments such as changes in the foreign trade policy of various countries, such as the USA and China, can have an impact on the Group's business.

In the U.K., the Group operates several manufacturing and sales entities accounting for a significant business volume. Any developments that have a negative impact on trade between the U.K. and other countries, such as the introduction of customs duties could therefore result in a corresponding decrease in Group's earnings. To date there have been no substantial negative effects from Great Britain's exit from the European Union ("Brexit"), but further developments are being closely observed, and some measures to reduce risks have already been taken, such as maintaining safety stock.

Since our Group companies operate globally and have international interdependencies, punitive tariffs and trade conflicts can have negative effects on our business activities. To reduce any possible impacts, various measures are currently being reviewed, such as an extension of our supplier network.

Business Cycle Risks

Owing to the concentration of its business activities in the life science sector, the effect of general economic developments on Sartorius is lower than average. The Bioprocess Solutions Division focuses on the biopharmaceutical industry, which is largely independent of economic cycles. In contrast, the Lab Products & Services Division is partly susceptible to business cycles that can pose a risk to its growth. Our strategy of also aligning the Lab Products & Services Division more strongly with the biopharma sector reduces these risks.

Operating Risks and Opportunities

Our supply chain extends from procurement to production to sales and distribution. Problems within this workflow can have consequential effects, including delays in deliveries. The supply chain management system we have instituted throughout our value-added chain to prevent such problems largely minimizes the associated risks by analyzing and controlling all operations involved. On the other hand, the strongly international alignment of our organization opens up a whole series of opportunities. The various risks and opportunities encountered within our supply chain are explained in detail below.

Procurement Risks and Opportunities

We purchase a wide range of raw materials, components, parts and services from suppliers and are consequently exposed to the risks of unexpected delivery bottlenecks and | or price increases.

Over the past years, we have implemented powerful tools and robust processes within the regular operating rhythm in our Supplier Management to manage supply risks and ensure supply continuity. Important measures in this respect are to maintain safety stock and to define alternative materials and suppliers. In addition, we conduct regular supplier reviews and carefully monitor the delivery status and inventory coverage of critical raw materials.

We actively mitigate procurement risks arising from the current raw material shortages in the market. By concluding binding purchase agreements with our suppliers and/or by seeking alternatives within our supplier network, we reduce their impact and secure continuous supply.

Opportunities can arise in the area of procurement when our growth enables us to increase order quantities and thereby strengthen our position with our suppliers, such as by receiving price discounts or preferential treatment.

Production Risks and Opportunities

Based on our core technology expertise, we ourselves manufacture a significant proportion of the products that involve a high level of vertical integration. Examples include filters and laboratory balances. Other products, such as reusable fermenters and bioreactors, are manufactured in collaboration with suppliers so that some of the production risks are transferred to external third parties. Where we manufacture products ourselves, we also bear the associated risks of capacity bottlenecks or overcapacity, production downtimes, excessive reject rates and high levels of tied-up working capital, as well as dependency on individual manufacturing sites.

We contain these risks by planning production capacities carefully, using versatile machines, semi-automated individual workstations and flextime work schedules, and by continuously monitoring production processes. Moreover, our global manufacturing network enables us to compensate for any capacity bottlenecks by shifting production to other regional plants and to limit our dependency on individual local manufacturing sites. Furthermore, we have taken out policies for business interruption insurance to compensate for any possible losses due to production downtimes.

Some of our production processes use mildly flammable or explosive materials. The improper handling of such materials can result in significant damage to property and business interruptions. We have taken all necessary organizational and structural measures at the affected locations to mitigate this risk as much as possible.

We consider it an opportunity that our investments in infrastructure and production resources, among other things, have given us high flexibility in our manufacturing operations and that we are capable of meeting our customers' requirements and regulatory standards with respect to business continuity concepts. In addition, this approach ensures that our international production sites can concentrate on specific manufacturing technologies, leveraging regional cost advantages as a result. Continuous improvements in production, such as simplifying processes, increasing levels of automation and digitizing the core drives, manufacturing and logistics efficiency even higher.

Sales and Distribution Risks and Opportunities

We use a variety of channels to sell and distribute our products around the world. The potential risks entailed are unexpected changes in the demand structure, growing price pressure and non-compliance with supply agreements concluded with customers. We employ targeted market analyses to identify emerging demand trends in individual segments early on so that we have time to respond appropriately. Our technical innovations and the fact that a large number of our products are used in validated production processes in the biopharmaceutical industry reduce our exposure to the risk of growing price pressure. We have minimized our risk exposure in the area of logistics in recent years by setting up and using central warehouses to optimize distribution logistics.

Opportunities arise in the area of sales and distribution when the increasing breadth of our product range – in both the bioprocess and lab segments – puts us in a position to sell new products to existing customers. Moreover, our business relationships, most of which are established for the long term, and our global presence provide opportunities. Finally, through our acquisitions in cell analysis, we offer customers in the biopharmaceutical industry, a key sector for us, comprehensive product solutions to address needs ranging from research laboratories all the way to production processes.

Sartorius sources its key customers from the pharmaceutical, chemical and food industries and from research and educational institutions of the public sector. These customers are usually relatively large organizations that have been in existence for some time and have strong credit ratings. Most of our business areas have a highly diversified customer base so the Group as a whole is not dependent on individual key accounts to any significant degree.

Competitive Risks and Opportunities

Sartorius has a leading competitive position in its core technologies and competes with mainly larger rivals sharing our status as a globally operating company. As we serve a large number of customers from highly regulated sectors like the pharmaceutical and food industries, and the technology barriers to market entry are fairly high, we regard the probability of new competitors emerging within the short term as relatively low.

The fact that many of our products are used in validated processes, especially those in the biopharmaceutical industry, reduces the risk of losing significant market share within a short timeframe. Conversely, the hurdles faced by Sartorius in winning clients from our competitors in this industry are also higher.

Changes in the competitive environment, for example, further consolidation in the markets, can pose further risks but also opportunities. Sartorius has been continuously making acquisitions in recent years, thus further strengthening its market position and opening up new potential synergies.

Quality Risks and Opportunities

Our customers use Sartorius products in a wide range of critical production processes, including the manufacture of medications, foods and chemicals, and in research and development laboratories. The main risk encountered in these areas is non-compliance with specified quality criteria, impacting the performance of our products, which - in worse case - can lead to losses for our customers, or their customers for which we may be made liable through compensation claims.

We employ rigorous quality checks and advanced production methods and processes, such as cleanroom technology, to ensure that our products satisfy the most stringent quality standards and high regulatory requirements. These manufacturing methods and processes are subject to constant review under our continual improvement processes, moreover, and are optimized as requirements evolve. Quality control tests are implemented through, in-process control tests and test procedures of final products to ensure that critical or essential product properties are continuously met. A rigid product release process ensures, that only products will be shipped that are in compliance with the agreed specifications.

The effectiveness of our quality system is confirmed through the successful completion of regular audits by customers as much as through implementation of certified quality systems compliant with ISO 9001 and, where applicable, with ISO 13485 documenting the high level of quality achieved in Sartorius products and processes. Irrespective of these measures, we also maintain significant insurance coverage against product liability risks.

In addition, Sartorius has established a traceability system that enables us to efficiently identify and if required recall an entire production batch immediately. This minimizes the consequences in the event that a defect or non-conforming item is discovered in a product and ensures compliance to regulations. We have also installed a complaints management system to deal with customer requests promptly and to ensure efficient documentation.

In the sectors we address, quality requirements are growing more and more stringent all the time, not least as a result of increasing requirements on protection of medical patients and on product safety by regulatory authorities. There is a risk that new regulations may be overlooked or be difficult to implement. For Sartorius, this also unlocks opportunities by putting up further barriers to entry for potential market players. The reason is that challenging quality demands represent a considerable barrier to entry for potential new competitors and provide stimulus for further technical innovation. Moreover, through our work on professional committees, membership in industry associations and standards committees, we actively take part in drafting new standards and guidelines, and are able to identify these emerging requirements at an early stage and prepare ourselves accordingly.

Research and Development Risks and Opportunities

We devote a considerable share of our resources to research and development. Potential risks in this area may arise from development results that diverge from market needs or application requirements and from

exceeding planned development deadlines and budgets. Our approach into trend monitoring as well as early stage proof of concept activities to de-risk the product developments as well as the project management, intensive R&D controlling and early involvement of our customers in the development process substantially limit these R&D risks. In particular, we ensure that proof of concepts and product designs are always reviewed promptly with regard to how well they meet customers' needs so products can be adapted accordingly as required. The continuous tracking of the technology trends and competitor activities together with an early stage patent filing ensure our technology and marketing position.

Not least, our intensive collaboration with partners that rank among the global market and opinion leaders in their own fields opens up the opportunity for us to jointly develop products with an especially high level of innovation. In areas such as membrane technology and plastics technology, sensorics and biopharmaceutical process engineering, and analytic technologies for laboratory applications, the expertise of our own specialists puts us worldwide at the very forefront of global research and development, presenting us with an opportunity to turn this technical knowledge into potential sales and an even stronger position on the market. The combination of different innovative activities in a separate Corporate Research Department enables us to identify promising developments at universities, startups and at our customers' plants and ensure the all relevant IP positions are secured in advance.

Acquisition Risks and Opportunities

By nature, acquisitions provide many opportunities, such as sales growth, extension of our product portfolio and development of new markets. By contrast, the purchase and sale of companies or parts of companies entail a number of typical risks, such as incorrect valuation assumptions or insufficient usage of anticipated synergy effects.

We take various measures to reduce these risks. These include performing a thorough due diligence review of important areas and carrying out comprehensive analysis of the market concerned. In addition, we involve external consultants and experts in the purchase or sales process as required. We especially focus on drafting transaction contracts so that they adequately counter such risks, especially by clauses assuring specific characteristics or by contractual warranty or guarantee provisions, as well as agreements on mechanisms for adjustment of the purchase price and on liability clauses. Appropriate insurance policies are taken out when necessary. Immediately after an acquisition has taken place, an integration phase is initiated in which any potential risks can likewise be detected as early as possible and prevented or minimized by taking the appropriate counteractions. A Post Merger Integration (PMI) Office was established as an independent function in the Business Process Management Department to ensure the efficiency of the integration process and minimization of the associated risks.

Personnel Risks and Opportunities

As an innovative technology group, Sartorius employs a large percentage of highly qualified people. This entails the risk that Sartorius may not be able to hire sufficient numbers of highly qualified employees in the future or may lose high performers currently at the company. The strong growth of the Group and the associated expansion of its workforce moreover pose sizable challenges for the integration and familiarization of new employees, and thus also harbor risks.

We therefore aim to keep key employees for the long term by offering performance-related remuneration models, targeted continuing professional development options, attractive social benefits and interesting people development opportunities. In connection with this, we have, in particular, enhanced our staff development initiatives and management programs. The success of these measures is apparent in the low

attrition rates of past years. Employment contracts in certain cases contain a clause prohibiting any move to a direct competitor.

We counter demographic change primarily by offering continuous education and training for junior staff members. This, in turn, results in opportunities for Sartorius as we can further qualify employees on our own and retain such staff over the long term, thus covering company needs for qualified personnel particularly well.

In order to ensure the seamless onboarding of the large number of new staff and also proper knowledge transfer, we have improved and expanded our initial training processes. We also use a digital HR platform, which supports secure and stable processes and enables decisions to be made on the basis of high quality data.

IT Risks and Opportunities

The Sartorius Group's business processes are supported by a wide array of specific software applications and IT systems. A failure or significant impairment of the business-critical IT systems and the supporting technical infrastructure due to cyber-attacks or other threats, could significantly hamper the smooth functioning of the company's business processes and lead to manipulation or the uncontrolled loss or outflow of data.

We are reducing these risks by continuously investing in the implementation and operation of secure IT systems and applications and by continually developing and applying our concepts and security measures on the basis of the international ISO 27001 Standard for Information Security Management Systems, among others. In addition, we incorporate the results of regular audits and vulnerability assessments by external companies specializing in IT security.

The protection of our data, systems, and applications from misuse is managed through a unified risk management framework on a group basis, established through the governance structure and IT risk management, and implemented through applicable policies and effective communications and practices. Fundamental principles such as secure configuration, user training and security awareness, network security, malware prevention, privilege management, and incident response are fundamental to our security organization and procedures.

We continue to expect the threat of cyber-attacks to increase worldwide, both in number and intensity. That is why we have again stepped up our measures and activities this year. We have strengthened the Group-wide IT security organization in terms of personnel and expertise, established a round-the-clock security control and defense team, and set up further systems and services to monitor, detect and defend against cyber-attacks.

We actively provide targeted information across the Group on potential cyber threats and risks, and engage employees by giving them simple but effective ways to defend themselves in a decentralized manner and report suspicious incidents to IT department for review.

Financial Risks and Opportunities

The global nature of the Sartorius Group's operations entails that its business activities are inevitably exposed to financial risks. The most significant of these are exchange rate risks, interest rate risks, liquidity risks and tax risks. Conversely, financial risks, most notably exchange rate risks and interest rate risks, are balanced by opportunities of approximately equal magnitude.

Exchange Rate Risks and Opportunities

As a consequence of its global business activities, the Sartorius Group is exposed to risks arising from fluctuations in foreign exchange rates. Since we generate around two thirds of consolidated sales revenue in foreign currencies and, in turn, approximately two thirds of this total revenue in U.S. dollars or in currencies pegged to the U.S. dollar, we are positively or negatively impacted by currency effects when converting the currencies of balance sheet items and profit or loss items, respectively. Other currencies relevant to the Sartorius Group are the British pound, the Singapore dollar, the South Korean won, the Japanese yen, Chinese renminbi and the Swiss franc.

Our global production network enables us to offset the majority of sales revenues generated in foreign currencies within the Group against costs likewise incurred in foreign currency. For example, we manufacture many of our products for the North American market locally, and are not disadvantaged on the cost side in competing with our U.S. rivals, insofar as this risk is concerned.

We continuously calculate our risk exposure with a cash flow at-risk model in order to evaluate and steer the remaining risk based on the expected net exposure for the next 12 months and take into consideration hedging transactions already executed. This is the basis we use to decide on whether to employ additional derivative financial instruments, especially spot, forward and swap transactions, to adjust for maximum loss.

Interest Rate Risks and Opportunities

We have concluded fixed interest agreements for more than 80% of our loans outstanding so that any changes in the interest rate will not have any meaningful effects on consolidated earnings. The remaining portion of the financial instruments outstanding on the reporting date is subject to variable interest rates based on the market rate. We monitor interest rate trends and our interest rate exposure constantly and arrange for hedging transactions where we consider it necessary and economically advisable to do so for individual loans. As of 12/31/2021, we did not have any interest rate derivatives in our portfolio of financial instruments.

Liquidity Risks and Opportunities

The Sartorius Group actively manages liquidity centrally in order to minimize liquidity risks in the individual Group companies on the one hand and to optimize liquidity management within the Group on the other hand. For this purpose, we use various long- and short-term financial instruments. Regarding the maturities of our loans, we make it a policy to take a risk-averse approach.

For short-term liquidity procurement, we also employ various instruments. In addition to the syndicated credit line that can be accessed and repaid at short notice, we have a number of bilateral credit lines in place on a smaller scale for individual Group companies. Furthermore, we use cash pooling agreements between selected Group companies as the primary instrument for managing liquidity within the Group.

Tax Risks

The Sartorius Group and its subsidiaries do business across the globe and are therefore subject to the tax laws and regimes of various countries. Changes in tax laws, rulings by the courts and interpretation of the law by the fiscal authorities or courts in these countries can result in additional tax expenses and payments and thus also affect the corresponding tax items in the statements of financial position and profit or loss.

We manage the resulting risks by continually monitoring and analyzing tax conditions along with our central Tax department with the support of third-party consultants in the respective countries.

Compliance Risks

Regulatory Risks

Our role as a partner of the biopharmaceutical industry and healthcare providers means that Sartorius can also be affected by underlying developments in these areas. In this context, the principle source of risk is the possibility that regulatory authorities, such as the U.S. Food and Drug Administration (FDA), the European Medicines Agency (EMA) and the Chinese National Medical Products Administration (NMPA), might adopt a more restrictive approach to the approval of new medications or the medical devices of our customers. In addition, adherence to the regulations of other relevant authorities like the Environmental Protection Agency or the Department of Agriculture in the USA is important to contain local or global regulatory risks.

Such a move would reduce the number of new pharmaceutical products to be marketed and would consequently downgrade future prospects for Sartorius over the medium term.

Environmental Risks

Sartorius has set up a cross-divisional environmental management system for managing environmental issues and mitigating risk. In addition, most of the large production sites have been certified according to ISO 14001: 2015, including our companies in France, India, Puerto Rico, and China. At these sites, corresponding organizational units have been set up to ensure compliance with relevant legal and regulatory requirements and the continuous implementation of sustainable technical innovation to improve environmental aspects in production processes. It is important to us to incorporate environmental topics in almost all decision-making processes as early as possible. In this way, we can systematically reduce potential environmental risks and operate the business in a sustainable and environmentally friendly fashion.

Environmental and sustainability aspects are occupying an increasingly important role in many business processes for us. The aspect of environmentally sustainable business has thus become a central element of how we select suppliers. For more information on these topics, please see the non-financial Group statement.

Litigation Risks

Litigation risks for Sartorius can arise from pending or forthcoming legal disputes or from administrative proceedings. All judicial or extrajudicial disputes are attended to by the company's own attorneys and legal experts, who engage external lawyers as needed.

At present, there are no pending or discernible legal disputes or proceedings that lack any cost coverage allowances in the statement of financial position or that could have a substantial negative impact on Group.

Assessment of the Overall Risk Situation and Risk Outlook

Where feasible, we adopted countermeasures and|or made risk provisions in the balance sheet during the reporting year to cover all discernible risks within the Sartorius Group, and those of a defined probability of occurrence, that had the potential to damage our net worth, financial situation and profitability.

For the purposes of this report, we have assessed the probability of occurrence of the risks as shown below and, in the adjacent columns, classify their particular significance for the entire Group. There were no material changes in comparison with the prior year.

Risk Category	Probability of Occurrence	Significance	Total Impact
External risks			
General risks	Possible	Moderate	Medium
Business cycle risks	Possible	Moderate	Medium
Operating risks			
Procurement risks	Possible	Significant	Medium
Production risks	Possible	Significant	Medium
Sales and distribution risks	Possible	Moderate	Medium
Competitive risks	Remote	Moderate	Low
Quality risks	Remote	Significant	Medium
Research and development risks	Possible	Significant	Medium
Acquisition risks	Possible	Significant	Medium
Personnel risks	Possible	Significant	Medium
IT risks	Possible	Significant	Medium
Financial risks			
Exchange rate risks	Probable	Moderate	Medium
Interest rate risks	Probable	Insignificant	Low
Liquidity risks	Remote	Moderate	Low
Tax risks	Possible	Moderate	Medium
Compliance risks			
Regulatory risks	Possible	Significant	Medium
Environmental risks	Remote	Moderate	Low
Litigation risks	Possible	Moderate	Medium

After thorough analysis of the entire risk situation and according to our current review, there are no discernible risks at present that could jeopardize the continued existence of the Group.

Similarly, based on our current review, there are no discernible risks that could jeopardize the future existence of the Group.