

Annual Report 2019



DFS Deutsche Flugsicherung

The business year 2019

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Report of the Supervisory Board

Type and scope of review and consultation

In the business year 2019, the Supervisory Board performed its functions as prescribed by law and the Articles of Association. It regularly advised and monitored the Board of Managing Directors and was involved in decisions of fundamental importance to the company.

In fulfilling its tasks, the Supervisory Board was supported by the audit committee, the committee for the commercial business, the personnel committee, the project committee and the conciliation committee. The committees thoroughly discussed the resolutions to be adopted and prepared recommendations for the decisions to be taken at the plenary meetings. The committee for the commercial business also provides general advice to the Board of Managing Directors on the further development of the commercial business. To this end, the committee was continuously informed about important projects in the commercial business.

In the business year 2019, there were no changes to the composition of the Supervisory Board.

The Board of Managing Directors reported to the Supervisory Board on the basis of quarterly reports in accordance with Article 90(1)(3) of the German Stock Corporation Law (AktG). The Supervisory Board was informed on important issues on an ad hoc basis. The Board of Managing Directors reported to the Supervisory Board in due form.

During the business year 2019, the Supervisory Board held four ordinary meetings to discuss the situation and development of the company. There were two extraordinary meetings, in which the appointment of a fourth managing director and the early departure of the Managing Director Operations, Mr Robert Schickling, were discussed.

The Supervisory Board specifically dealt with the following topics at its meetings:

- the 2018 annual financial statements and consolidated financial statements, the management report, the group management report as well as the audit report on the 2018 annual financial statements and consolidated financial statements
- the 2020 group economic plan, with the associated investment and financial plan
- the traffic development and capacity situation
- the commercial business strategy
- the DFS programme for the future, Sprint2024
- the tender submitted by DFS Aviation Services GmbH (DAS) for the provision of air navigation services at regional airports in Spain

In addition, the Supervisory Board approved the follow-on investment for the remote tower control (RTC) project.

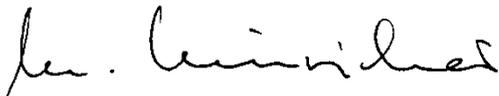
Result of the review

The Supervisory Board observed that the course of consolidation adopted continued to prove its worth in the year under review. Measures to increase capacity partially negated this success in 2019. However, the cost-cutting measures are proving to be sustainable in all other respects. The Group's strategy programme (five-point programme) has achieved the intended effect in its other elements as well. It should be emphasised that the traffic growth in 2018 and 2019 had not been predicted.

On the basis of the audit report prepared by the auditors Mazars GmbH & Co. KG, the Supervisory Board discussed the 2018 annual financial statements and consolidated financial statements and the management report including conclusions in accordance with Article 53 of the German Budgetary Principles Act (HGrG) as well as the group management report. The audit committee met for discussions in advance. The comprehensive control and risk management system established in the company was included in the audit. The auditors were present at the discussions. They gave an account of the key results of their report and were available to answer questions. The Supervisory Board found no exceptions to be taken against the audit report and the auditors' findings. It proposed that the Shareholder Meeting approve the annual financial statements and the consolidated financial statements. The Supervisory Board reviewed the proposal of the Board of Managing Directors on the use of profits and agreed to it.

The Supervisory Board would like to thank the Board of Managing Directors for its work in the interests of the company and the successes achieved in 2019. Moreover, these successes were made possible thanks to the commitment shown by all members of staff and the staff councils.

The Supervisory Board



Dr Martina Hinricher
Chairperson



Dr Martina Hinricher

Members of the Supervisory Board

Chairperson

Dr Martina Hinricher

Ministerialdirektorin (retired)

Deputy Chairperson

Markus Siebers

Air traffic controller

Frank Best

Colonel (G.S.)

Federal Ministry of Defence

Carmen von Bornstaedt-Radbruch

Ministerialrätin

Federal Ministry of Defence

Antje Geese

Ministerialdirigentin

Federal Ministry of Transport and Digital
Infrastructure

Dr Angelika Kreppein

Regierungsdirektorin

Federal Ministry of Finance

Sabrina Leitzbach

Air traffic controller

Dr Carl-Stefan Neumann

Bagus Neumann GbR

Peter Schaaf

Air traffic controller

André Vöcking

ANS engineer

Andrea Wächter

Head of Hamburg Tower

Jörg Waldhorst

Senior expert air navigation obstacles

Members of the Advisory Council

Chairperson

Steffen Bilger

Member of the German Bundestag
Parliamentary State Secretary

Dr Constantin Alsheimer

Chairperson of the Management Board
Mainova AG

Frank Annuscheit

Member of the Board of Managing
Directors
Commerzbank AG

Dr Jürgen Bierbaum

Alternate Member of the Boards
ALTE LEIPZIGER – HALLESCHE Group

Chris Fischer Hirs

Group Chief Executive Officer
Allianz Global Corporate & Specialty AG

Ingo Gerhartz

Chief of Staff, Air Force
German Air Force Command

Prof Dr Elmar Giemulla

President
Aircraft Owners and Pilots Association
(AOPA Germany)

Winfried Hermann (Member of the Land Parliament)

Minister
Ministry of Transport
Baden-Württemberg

Harry Hohmeister

Member of the Executive Board
Deutsche Lufthansa AG
(Member of the Advisory Council until
March 2019)

Michael Hoppe

Chairperson
BARIG – Board of Airline
Representatives in Germany e.V.

Dr Detlef Kayser

Member of the Executive Board
Deutsche Lufthansa AG
(Member of the Advisory Council from
March 2019)

Daniela Ludwig

Member of the German Bundestag
(Member of the Advisory Council until
October 2019)

Kirsten Lühmann

Member of the German Bundestag

Oliver Luksic

Member of the German Bundestag

Prof Dr Bernd Sanner

Medical Director
AGAPLESION BETHESDA
KRANKENHAUS WUPPERTAL gGmbH

Dr Stefan Schulte

President
German Airports Association (ADV)
Chairperson of the Executive Board
Fraport AG

Ralf Teckentrup

President
German Airline Association (BDF)
CEO of the Executive Board
Condor Flugdienst GmbH

Klaus Thiemann

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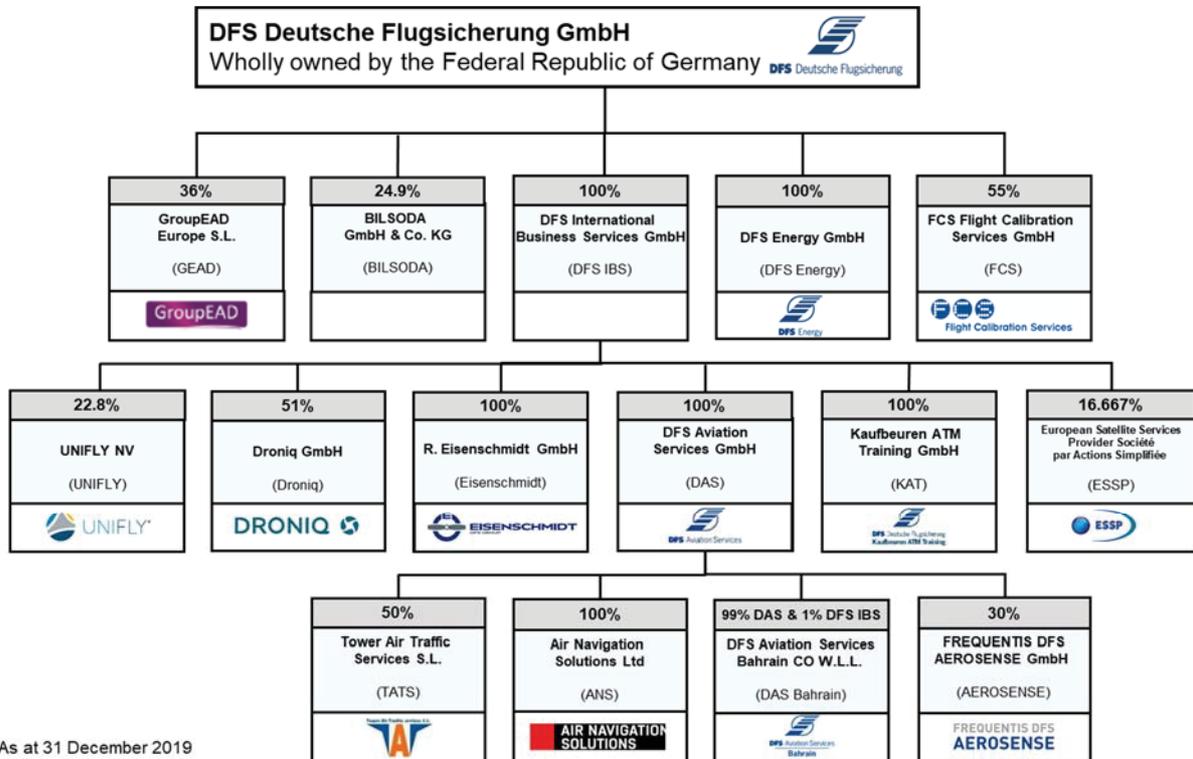
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Group management report

for the business year 2019

1 Group organising principles

1.1 Structure of the Group



As at 31 December 2019

DFS Deutsche Flugsicherung GmbH (DFS) manages the DFS Group as the ultimate parent company and carries out operational activities itself. The subsidiary and investment entities supplement the portfolio of services offered by the Group and operate in areas closely related to the aviation industry.

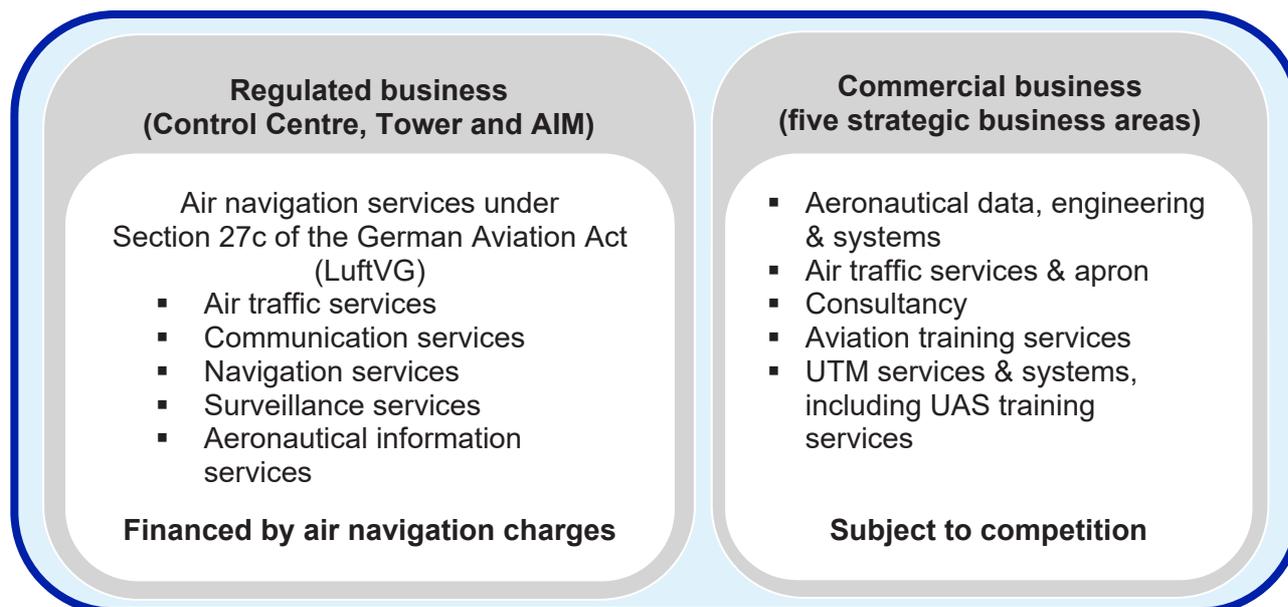
The consolidated financial statements cover eight direct and indirect investments. The results and financial position are primarily determined by the business activities of DFS. Information on the scope of consolidation can be found in Note 3.2.

1.2 Business activities

1.2.1 Overview

The DFS Group, which employs 6,052 operational and administrative staff (of which 5,585 at DFS), ensures the safety of German airspace and also offers additional products and services on the free market (the commercial business).

The DFS Group divides its business activities into two segments. One segment – the regulated business – is financed by air navigation charges, while the other segment – the commercial business – competes for business on the free market. The segment financed by air navigation charges is the main business.



1.2.2 Regulated business

The regulated business – providing air navigation services – is defined by the tasks set out in Section 27c of the German Aviation Act (LuftVG). As a company entrusted to perform State functions, DFS provides air traffic services (ATS) and support services. It operates control centres in Langen, Bremen, Karlsruhe and Munich as well as 16 control towers at international airports in Germany. For this purpose, it develops and operates ATS systems as well as communications, navigation and surveillance systems.

Control Centre division

The Control Centre division at DFS provides air traffic control in the terminal area (approach control service) and en-route (area control service), including the flight information service and the alerting service, and operates the corresponding ATS systems.

Since 1 January 2012, the European Commission has regulated en-route services by means of a performance scheme for air navigation services and network functions (Regulation (EU) No 390/2013) and the introduction of a common charging scheme (Regulation (EU) No 391/2013). The focus is on European and national requirements covering safety, environment, capacity and cost-efficiency. As the national supervisory authority, the Federal Supervisory Authority for Air Navigation Services (BAF) determines the German contribution to the performance plan at the level of the Functional Airspace Block Europe Central (FABEC). The charges are laid down by EUROCONTROL on the basis of a decision of the Enlarged Commission in accordance with the German Ordinance on Route Charges of the Air Navigation Services (FSStrKV).

Tower division

The Tower division at DFS controls air traffic at Germany's designated international airports (aerodrome control service), including all ATS systems as well as the flight information service and the alerting service.

The aerodrome control service has been subject to economic regulation since 2015. Terminal charges are set by means of a statutory instrument of the Federal Government (FSAAKV).

Aeronautical Information Management (AIM) division

The AIM division at DFS provides its customers with all relevant aeronautical information and aeronautical information services for the safe conduct of flights. AIM collects, processes and publishes aeronautical data, such as flight plans and NOTAM, and publishes numerous aeronautical publications and products, such as the Aeronautical Information Publication (AIP).

1.2.3 Commercial business

The management of the Group decided to bundle the commercial business (see also section 3.2) in subsidiary and investment entities under the DFS International Business Services GmbH holding company to the extent legally possible and economically sensible.

The subsidiary and investment entities support and enhance the portfolio of products and services offered by the Group on the free market. These commercial services are offered worldwide, while air navigation services are only offered in Europe. In contrast to the regulated business, the commercial business is not subject to regulatory requirements. Intra-Group transactions are conducted at arm's length conditions and prices.

In summer 2019, the Supervisory Board discussed the strategy of the DFS Group for the commercial business and recommended that the Shareholder approve the strategy and support its implementation. As a result, DFS is positioning itself as a leading provider of solutions and systems for the traditional air traffic management (ATM) business as well as for the developing business with the management of drone flights (UTM – UAS traffic management).

In the ATM market, DFS offers the complete range of its expertise in air navigation services and has a broad product and service portfolio in the strategic business areas:

- Aeronautical data, engineering & systems
- Air traffic services & apron
- Consultancy
- Aviation training services (such as training of air traffic controllers)

The situation in the UTM market is still largely unclear. Through its UTM service portfolio, DFS would like to belong to the leading players and take on an active role in the market. Here, DFS is establishing the business area with

- UTM services & systems, including UAS training services (support services for the operation of drones)

with the objective of the safe and fair integration of unmanned aircraft systems into the airspace.

These five strategic business areas cover the products and services offered by the DFS Group. The execution is assigned to individual subsidiaries.

1.3 Legal framework and management organisation

In 1993, DFS was entrusted with the tasks of the Federal Administration of Air Navigation Services (BFS) by the Federal Republic of Germany. The Headquarters of DFS are located in Langen near Frankfurt at: Am DFS-Campus 10, Langen, Germany. The company is registered under HRB 34977 on the Commercial Register at the Local Court in Offenbach am Main.

The object of the company is the development, provision and execution of the air navigation services delegated to the company by the Federal Ministry of Transport and Digital Infrastructure (BMVI). The company can also provide air navigation services in Europe as well as carry out related sideline activities in Germany and abroad.

The sole Shareholder is the Federal Republic of Germany.

The distribution of responsibilities among the Managing Directors of DFS forms the basis for the management organisation (as at 1 May 2018).

Chairman and Chief Executive Officer	Chief Operating Officer Managing Director	Chief Human Resources Officer Managing Director (Labour Director)
<ul style="list-style-type: none"> • Strategy, organisation, international affairs • Institutional and legal affairs, risk management, compliance • Export control • Safety and security management systems • Internal audit, quality management • Corporate communications, public relations, environment • Finance, including taxes and charges, insurances • General administration • Procurement • Consulting services and system deliveries • Military affairs 	<ul style="list-style-type: none"> • Air traffic services • Airspace management • Air traffic flow management • Aeronautical information service • Communication, navigation and surveillance services • Capacity planning and operational training for operational personnel • Product/system management for technical systems, logistics • Research and development • Technical and infrastructural facility management • Development of air traffic management (ATM) systems as well as business and administrative information technology 	<ul style="list-style-type: none"> • Human resources strategy • Collective bargaining (strategies and policies) • Human resources management • Human resources development, initial and continuation training • Initial training for operational personnel (air traffic services) • Staff planning (excluding capacity planning of operational personnel) • Payroll accounting • Compensation and incentive systems • Occupational pensions • Social and health management • Industrial safety, accident prevention • Labour law, collective bargaining law

The Board of Managing Directors is supported by the Executive Committee, which is made up of the Managing Directors and all members of the executive management level (division directors). At its weekly meetings, the Executive Committee discusses important corporate issues and shares information.

The Supervisory Board of DFS comprises 12 members, six appointed by the Shareholder and six elected by the employees (see Note 46.2 for the members of the Supervisory Board).

The subsidiary and investment entities in the commercial business are managed through the holding company DFS International Business Services. It holds, manages, administers and finances its operating investments by means of intercompany (Group) contracts, such as control agreements, profit and loss transfer agreements and cash pool agreements. It also limits the liability of DFS to the carrying amount of the investment of DFS International Business Services. The company implements the structural and operational rules laid down by the management of the Group by means of shareholder resolutions, employees of DFS taking on supervisory board membership and the contractual commitments set out in intercompany (Group) contracts. The board of DFS International Business Services consists of DFS executives, who carry out this role in addition to their normal duties.

The management of the Group is responding to the continuing consolidation in the aviation industry and the resulting diversified framework conditions and regularly reviews whether further measures to adapt and realign the structure of the Group need to be taken.

Changes in the Board of Managing Directors of DFS from 2020

DFS has restructured its Board of Managing Directors and implemented a resolution of the Supervisory Board dated 23 December 2019. From 2020, the company is dividing its management structure into four functional areas. The responsibilities and duties of the Directorates Chairman of the Board and Chief Executive Officer as well as Human Resources remain unchanged. The management responsibilities and duties of the former Directorate Operations have been split and supplemented by the new position of Chief Technology Officer (CTO). The former Managing Director Operations Robert Schickling left the company at the end of January 2020 at his own request. His successor, Dirk Mahns, started his new position on 1 February 2020. The Board of Managing Directors is completed by Friedrich-Wilhelm Menge as the new Chief Technology Officer as of 1 March 2020 (see also Note 42 "Post-balance-sheet-date events").

The Supervisory Board and the Shareholder are convinced that with the new composition of the Board of Managing Directors, DFS will be able to meet current and future challenges even more effectively. This move will support and accelerate the processes initiated to further develop DFS and the DFS Group as well as the associated changes.

1.4 Strategies and objectives

1.4.1 Strategic direction

"Together for safe and smart European skies"

The corporate strategy is based primarily on the sovereign task entrusted to DFS: handling air traffic in a safe, orderly and expeditious manner. With the premise of being the leader among the major European air navigation service providers (from German ANS to European ANS), DFS is positioning itself with its corporate vision "Together for safe and smart European skies". DFS guarantees its future viability and positioning within Europe through safety, innovative technology and economic viability.

Automation and digitalisation are increasingly important in the whole aviation industry, as in other areas, and are becoming key success factors.

Digital change offers a wealth of opportunities. The systematic analysis and networking of large volumes of data enables more efficient operations, greater economic efficiency as well as lean, efficient processes. It brings far-reaching changes at all levels across every stage of industry. It requires new ways of thinking, however.

In air traffic control, digitalisation offers opportunities for optimisation in terms of quality, productivity, new procedures and services, for example. It is therefore essential for DFS as an air navigation service provider to upgrade its technologies and to rigorously exploit the potential of digitalisation and automation to reduce staff workload and boost efficiency, for example.

Since the provision of our services is already based on the close interaction between our highly specialised employees and a complex technological system landscape, change management is an important success factor for DFS to establish new working environments and ways of working.

DFS is meeting these challenges in line with the objectives of the European Single European Sky (SES) regulatory process. Our main focus is centred on customer orientation, safety and the innovative technological positioning of DFS.

To achieve this, DFS pursues four central corporate objectives:

1. We aim to maintain an outstanding safety level at DFS and continuously develop and refine it.
2. We aim to fulfil all regulatory requirements through top performance in all key performance areas (KPAs).
3. We aim to increase profitability and productivity within the entire DFS Group.
4. We aim to achieve sustainable growth within the DFS Group.

1.4.2 Sprint2024 programme

In reference period 3 (2020–2024, see also section 2.2.2), DFS is launching the Sprint2024 programme to ensure the future viability of the DFS Group. The programme has defined



seven strategic lines of action and focuses on capacity and productivity through innovation and digitalisation under the banner of safety. It is a fundamental reworking of the five-point programme, which came to its scheduled end in 2019.

Safety

Safety forms the basis for the Sprint2024 programme and is an integral part of all lines of action. In the understanding of DFS, safety does not happen by itself; it has to be achieved again from scratch each day. DFS will create the framework for an innovative and efficient safety management system.

1. People and corporate culture

We will remain an attractive employer, develop our employees and attract new talented staff. We will embrace our values and standards and will create a culture in which all generations work together in an interdisciplinary way.

2. Capacity

We will expand our position as a leader in quality and guarantee a high safety level. We will react flexibly to capacity requirements and support our air traffic controllers and engineering staff by providing high-performance systems and procedures.

3. Innovation and digitalisation

We strive for technological leadership. We will modernise and invest in safe future technologies and establish an open exchange of data. We will embrace innovation and reduce complexity.

4. Economic viability

We will ensure the financial viability of the DFS Group and generate an adequate return through strict cost discipline. We will design efficient processes and use our resources optimally.

5. Commercial business and investments

In the area of commercial business, we will be a leading full-service provider for ATM and UTM solutions and systems, including for the Bundeswehr. We will create expertise through cooperation agreements and investments, and intend to generate revenues of €200 million by 2030 with an average return of 6 percent.

6. Environmental and climate protection

We will align our corporate actions with the demands of environmental and climate protection in a consistent and exemplary manner. We will become a climate-neutral company.

7. Europe and regulation

We will continue to strengthen our position as a leading ANSP in Europe and will be the driving force for SES in Europe. Together with our European partners, we will meet the challenges faced in aviation.

1.4.3 Financial strategy

The financial strategy of DFS promotes the financial stability of the Group and is based on the following areas:

Good to very good credit rating

Investors, business partners and employees should be able to continue to trust in the financial stability of the company and its subsidiaries. The company secures the very good investment grade rating in combination with its Shareholder (see section 2.6.3.1).

Adequate liquidity

In the current low interest rate environment, DFS maintains its room to manoeuvre over the near term by issuing attractively priced commercial paper (short-term) and using demand deposits (short-term). This will allow the company to react flexibly to changes in its environment at all times. The very good investment grade rating requires adequate liquidity safeguarded by fund assets not protected against insolvency.

Adequate capital structure and equity ratio

Measures are being taken to continuously strengthen the capital structure and equity ratio. The Shareholder strengthened equity from 2015 to 2018 through contributions to registered equity of around €601.9 million overall. The negative impact on the equity as defined under International Financial Reporting Standards (IFRS) stemming from the revised standards on the recognition of long-term employee benefits (see Note 28.8) from the 2013 business year will be reduced step by step over the following reference periods by being considered in the air navigation charges. DFS will continue to maintain the equity ratio shown in 'adjusted equity' (see Note 39.1) of 26.6 percent and to progress towards a fully funded status for occupational pensions in a step-by-step manner.

Low debt and unencumbered assets

The infrastructure of the company is unencumbered and remains the property of the company. This creates a stable asset base that is in essence freely available.

Risk management system

A modern risk management system supports the planning and control of financial risks in a consistent manner (see section 6.2.2.1).

1.5 Planning and control

When managing the Group, the Board of Managing Directors differentiates between the regulated business and the commercial business as required by the provisions of the Transparency Directive Implementation Act (TranspRLG).

Regulated business

The management of the regulated business is aligned with the regulatory environment, the strategic dimensions and objectives, the requirements of the regulated business, the organisational structure as well as the five-point programme, which came to its scheduled end in 2019. The planning and control process identifies suitable measures to be taken, embeds them in the yearly rolling five-year plan and continuously monitors the divisions.

Performance and cost objectives as well as the internal requirements stemming from the five-point programme, which ended in the business year 2019 (see section 1.4.2), determine the demands placed on the individual divisions.

The achievement of these objectives and requirements is measured by means of planned/actual comparisons, which are carried out both on a regular basis (monthly, half-yearly and yearly) and ad hoc. Achievement is monitored and reported at corporate, divisional and product level. A system of financial indicators has been developed. These indicators are primarily based on IFRS and are used for budgeting. The performance indicator of operating costs, which is determined and laid down on the basis of the following, contains primary costs as well as income and charges from internal costs allocation:

Operating costs
Staff costs
+ Other operating expenses (e.g. material costs)
+ Depreciation and amortisation
= Primary costs
+ Charges from internal cost allocation
- Income from internal cost allocation
= Operating costs

Planning and control also uses non-monetary indicators, such as the analysis of the traffic forecast, in addition to financial metrics on cost-efficiency.

As regards non-monetary indicators, DFS constantly measures indicators for the key performance areas of safety, air traffic control (ATC) capacity and the environment, such as infringements of separation, punctuality indicators and horizontal flight efficiency.

Commercial business

The commercial business is materially influenced by the competitive environment in which it operates. Planning and control is carried out by setting targets for contribution margins and returns on sales, whereby a positive contribution to earnings at the EBIT or EBITDA level should be generated.

The operating subsidiary and investment entities should generate a profit before tax typical for the industry. The rate of return is to be raised to six percent in the medium term.

1.6 Research and development

German airspace demands a particularly high-performing air navigation service provider over the long term, as this airspace is extremely busy and complex in international comparison. Technological and operational innovations represent an important means of managing the growing cost pressure, the increasing requirements as regards environmental sustainability and the rise in air traffic predicted in all forecasts for the medium term. These issues must all be managed while maintaining an unrestricted safety level. Therefore, DFS has been involved in international and national research projects for many years. It concentrates on applied research which leads to new products, procedures and working methods and follows the path from invention to innovation.

The most prominent project at the international level is the SESAR programme (Single European Sky Air Traffic Management Research), which encompasses all areas of air navigation services. It is organised within the scope of the SESAR Joint Undertaking, which DFS joined as an active member in June 2009, along with other leading organisations (air navigation service providers, airspace users, airports and manufacturers).

National activities focus on regional challenges, such as the optimisation of flight routes for overflights and the operation of busy airports, such as Frankfurt and Munich (including their arrival and departure procedures). DFS conducts real-time and fast-time simulations, tests new key technologies and subsequently develops air traffic control software and suitable simulators. DFS also participates in funding programmes from the Federal Government, such as the aeronautical research programme and the mFUND research initiative (*Modernitätsfonds*). In the aeronautical research programme, DFS is once again managing a consortium project. The goal of grant projects, and of all other forms of cooperation, is to work jointly with German partners from research and industry to improve the starting basis for subsequent international activities.

DFS promotes the development of innovations. These currently include:

- The remote provision of aerodrome control services without a control tower on site (see section 7.2.1 under *Remote tower control (RTC)*).
- Sectorless flying: a pioneering concept that assigns aircraft in the entire controlled area to a particular air traffic controller and which promises more expeditious traffic handling with less effort (see section 7.2.1 under *Project S-ATM Robusto*).
- Surveillance systems that use all available sensors, such as various radar systems, multilateration and the positions determined by the aircraft themselves, to be able to track the aircraft seamlessly from gate to gate, on the ground as well as in the air.
- Controller assistance tools that reduce their workload by means of optimised information processing, especially through advice on conflict avoidance, and by means of step-by-step automation.
- The interoperability of European air traffic management systems that keeps pace with new developments – an important precondition for the SES initiative (Single European Sky) (see section 7.2.1).
- An advanced, cost-efficient standardisation of technical infrastructure and procedures as a precondition for further automation and innovation.
- Extensive virtualisation of air traffic control systems and establishment of data centres in the medium term.
- Comprehensive activities for a safe and fair integration of unmanned aircraft systems (see section 2.2.1 under *Drones*).

DFS allocated a total of approximately €51.7 million and around 295 staff posts to research and internally generated developments. The capitalisation ratio equals roughly 39.0 percent.

Grant funding payments of €41.3 million were received in 2019 from European research framework programmes for this purpose, including from SESAR and the German aeronautical research programme. The implementation of the R&D results also takes place within the scope of the SESAR Deployment Alliance (SDA) together with air navigation service providers, airlines and airport operators.

2 Report on economic position

In addition to the overall economic situation, political, legal and industry-specific factors have a fundamental influence on the development of air transport. A flourishing global economy acts as a growth engine for the aviation industry. Nevertheless, there are factors which have negative effects, such as political tensions, natural disasters, negative regulatory, legal and tax issues as well as temporary and local, or even global, geographic concentrations of illnesses. The number of flights has a material influence on the business activities of the regulated business. It is also a major factor for the commercial business, as DFS Aviation Services (at nine German regional airports) and Air Navigation Solutions (at Gatwick and Edinburgh airports in the United Kingdom) provide air navigation services as well. The aviation-related consultancy projects, technical support services and specialist publications follow the general trend of the aviation sector.

2.1 Overall economic situation

Global economic growth fell short of expectations in 2019. Trade tensions, triggered by increasing protectionism, slowed exports and industrial production worldwide. This was compounded by geopolitical tensions, such as those between the United States of America and Iran, and anti-government protests in many countries, which were detrimental to the economy. According to estimates of the Organisation for Economic Cooperation and Development (OECD), global real gross domestic product (GDP) rose by 2.9 percent in 2019. In the previous year, the OECD was still forecasting global growth of 3.5 percent. The World Bank expected global economic growth of 2.4 percent in 2019. In its forecast for 2019, the multinational development bank was still assuming an increase of 2.9 percent for 2019. Overall, 2019 saw the slowest pace of growth since the 2009 global financial crisis.

According to a first estimate of the annual growth rate for 2019, based on the available quarterly data, the European Statistical Office (EUROSTAT) is assuming year-on-year growth in GDP of 1.2 percent in the euro area and 1.4 percent in the EU-28. In its 2018 autumn forecast, the European Commission was still expecting economic output in the euro area to grow by 1.9 percent in 2019.

In Germany, real GDP in 2019 rose by 0.6 percent over the previous year according to the Federal Statistical Office. The German economy thus grew for the tenth year in succession. However, the upturn lost momentum in 2019 and remained close to the expectations of the Federal Government from its Autumn Projection 2019 of 0.5 percent, but below the 1.0 percent forecast of the Annual Economic Report 2019. Given the weak macroeconomic conditions, growth for 2019 was supported primarily by consumption. German exports increased on average in 2019, albeit less strongly than in previous years.

2.2 Development of business

Global macroeconomic developments did not leave air transport unscathed. Although demand for air transport continued to rise worldwide in the previous year, growth slowed slightly compared with the prior year in Europe and especially in Germany. This decline, which mainly occurred in the second half of 2019, can be primarily attributed to the slowdown in economic growth in Germany and the reduction in overcapacity, which had initially been built up disproportionately following the insolvency of Air Berlin. The insolvency of Germania in January 2019 was one of the main reasons for the decline in traffic volumes at the German airlines.

The DFS Situation and Information Centre recorded a total of 3,334,424 controlled aircraft movements in German airspace in 2019 (previous year: 3,346,448), representing a decrease of 0.4 percent over the previous year. This is the first decline in traffic volumes in German airspace, following five years of rising growth rates. DFS controlled 3,125,734 of these flights (previous year: 3,121,493). The busiest day of 2019 was 4 July, with 11,012 IFR flights.

It was a difficult year for the aviation industry in Germany, with many challenges, such as declining economic momentum, market consolidation and an intensifying climate debate. Nevertheless, DFS enjoyed many successes and made progress in its strategic positioning despite all the difficulties. Once again, DFS achieved its primary objective, safely controlling well over three million flights in German airspace.

In view of the unexpectedly high traffic volume in 2018, which had caused problems for the entire aviation industry and led to capacity bottlenecks on the ground and in the air for airlines, airports and air navigation service providers throughout Europe, the industry largely managed to halt the trend of delays in 2019. The delays caused by DFS could be reduced appreciably in the second half of the year. The aviation summits in Germany in October 2018 and March 2019, at which representatives from politics, airports, airlines and DFS developed and implemented a total of 24 measures to combat the delay situation, were instrumental in achieving this goal.

DFS implemented more than 70 individual measures to improve the delay situation. At the end of April, for example, DFS launched the Europe-wide eNM/S19 initiative (enhanced NM/ANSPs network measures for Summer 2019) in German airspace. This initiative focused on shifting flights from heavily congested sectors in upper airspace to lower airspace as well as introducing some lateral shifts. Since June, following an agreement with the party to the collective agreement on a capacity increase and stabilisation pact, it has also been possible to integrate additional shifts into operations in order to manage traffic better.

Since mid-June 2019, DFS has been more punctual every week than in the prior-year period, in some weeks by up to 40 percent – an impressive achievement, which benefits DFS customers in particular. At the beginning of the year, some forecasts still indicated that there would be more delays in air traffic in 2019 than in 2018.

Nevertheless, improving capacity remains an important issue. Despite the slowdown in the growth of air traffic, DFS will continue to recruit more operational staff for the foreseeable future. The Board of Managing Directors has decided to further increase the pipeline of new DFS controllers from 126 in 2019 and to boost the number of these training positions to 146. Other measures to improve capacity include the modernisation of infrastructure and the further development of air traffic control systems. Increased efforts are being made to ensure the timely introduction of the iCAS II air traffic control system in lower airspace.

A further milestone was the commencement of operations of Droniq GmbH in May 2019 (see section 3.2.1) after the German Federal Cartel Office (*Bundeskartellamt*) approved the founding of the company in December 2018. Droniq is a joint venture between DFS (through its subsidiary DFS International Business Services) and Deutsche Telekom AG whose objective is to provide, market and sell services for drones and other aircraft in Europe. It reflects the conviction that the future of air transport requires the coexistence of ATM and UTM services. With the founding of Droniq, DFS is providing a technical response to the new drone regulation introduced by the European Commission and is launching a jointly developed technology for tracking drones on the market.

The safe integration of drones into airspace is a challenge that air navigation service providers worldwide will have to face in the future. To answer this question, DFS and Deutsche Telekom have developed a technology that uses the mobile communications network to track unmanned aircraft systems (UAS). This has put in place one of the central preconditions to be able to safely operate drones across larger distances, and not just in close vicinity to the pilot. Delivering this precondition is a necessary step for the economic operation of unmanned aircraft systems. DFS considers itself well positioned to achieve its goal of becoming the technological leader in this field as well.

Another success in 2019 was the official opening of the new training centre for military air traffic services personnel at our subsidiary Kaufbeuren ATM Training GmbH (KAT) in Kaufbeuren (see. 3.2.1). In future, there will be room for 80 course participants. This smooth opening was made possible above all by the close working relationship between DFS, Kaufbeuren ATM Training and the Bundeswehr.

Other successful measures taken in the previous year to ensure the future viability of DFS and the DFS Group include many technical projects and administrative improvements as well as personnel policy measures. All DFS executives have passed through the three waves of the Next Level Leadership management programme. This programme also addresses future executives.

In addition, DFS concluded new collective remuneration agreements with the party to the collective agreement (see section 4), which take into account the economic situation of the company and, through their structure, improve the remuneration situation, especially of employees with lower incomes.

DFS successfully completed the five-point programme in the business year 2019. Employees, executives and the Board of Managing Directors worked intensively on this programme in the past years. DFS was thus able to improve the working relationship with the social partner, establish a new cost awareness and successfully expand the commercial business. In addition, other important developments in the human resources area were implemented, such as the certification and recertification of the Work and Family initiative or the establishment of dual courses of study in air traffic control.

The challenges for 2020 were already being addressed in the past year. The ongoing digitalisation has changed the external environment for DFS. In order to be well positioned for the future, investments in technology must be stepped up. For this reason, DFS has launched the Sprint2024 programme (see section 1.4.2). The new programme builds on the five-point programme and provides a definitive orientation on the strategic priorities for the coming years.

2.2.1 Development of air traffic

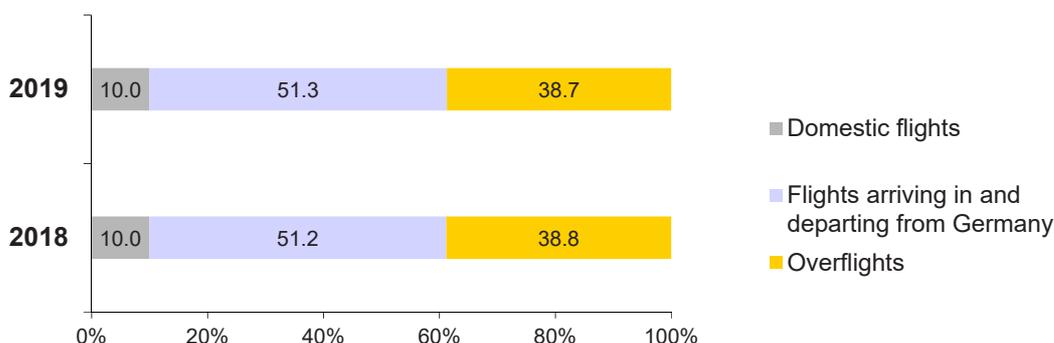
IFR flights 2019

IFR flights in Germany			
	2019	2018	Change
Civil flights	3,292,207	3,303,940	-0.4%
Military flights	42,217	42,508	-0.7%
Total	3,334,424	3,346,448	-0.4%

The busiest day of 2019 was 4 July, with 11,012 controlled flights.

The breakdown of domestic flights, arrivals and departures as well as overflights remained basically the same as in the previous year.

Distribution of IFR flights (%)



Traffic at the airports where DFS operates

In 2019, traffic barely rose (0.1%) over the previous year at the designated international airports in Germany. At almost all airports, the very positive trend at the beginning of 2019 weakened as the year progressed and turned negative in some cases at the end of the year.

Frankfurt and Munich airports grew year-on-year thanks to their strong focus on intercontinental traffic. At Düsseldorf Airport, a slight statistical catch-up effect from the Air Berlin insolvency and the subsequent route offering by Eurowings led to substantial growth.

Leipzig Airport is now regarded worldwide as the central air freight hub in Europe. Freight volume is growing, and therefore total traffic volume, too.

Traffic at Berlin Tegel Airport grew compared with 2018. The commitment of easyJet, which took over Air Berlin's routes and further expanded its portfolio, is having a particularly positive effect. Growth at Berlin Schönefeld Airport suffered from this move, however, as a large part of the easyJet service was relocated from there to Berlin Tegel Airport. At Cologne Bonn Airport, not only did passenger volumes decline, but cargo volumes also fell by approximately 5 percent. This resulted in a slightly negative trend for 2019.

Above all at Nürnberg Airport, but also at the smaller airports, the insolvency of Germania and the route consolidation by Ryanair and other low-cost airlines had a negative impact.

Traffic at the designated international airports			
	2019	2018	Change
Frankfurt	513,722	511,844	0.4%
Munich	414,068	410,242	0.9%
Düsseldorf	225,440	218,204	3.3%
Berlin Tegel	192,958	186,535	3.4%
Hamburg	149,239	148,853	0.3%
Cologne Bonn	142,117	142,870	-0.5%
Stuttgart	132,669	128,194	3.5%
Berlin Schönefeld	90,124	100,778	-10.6%
Leipzig Halle	75,432	74,736	0.9%
Hannover	64,781	65,928	-1.7%
Nürnberg	49,417	54,149	-8.7%
Bremen	29,984	31,198	-3.9%
Dresden	20,707	22,233	-6.9%
Münster Osnabrück	18,939	19,359	-2.2%
Saarbrücken	7,988	9,119	-12.4%
Erfurt Weimar	4,704	5,502	-14.5%
Total	2,132,289	2,129,744	0.1%

Traffic in the United Kingdom (UK)

The United Kingdom saw its strongest year for aviation so far in 2019. Overall, traffic volumes rose by 0.9 percent over the previous year to 2,580,206 flights (EUROCONTROL DAIO Report), marking the seventh year of growth in succession following the financial crisis. Air traffic in the United Kingdom grew by more than 13 percent in the last ten years (2009–2019).

Competition and airlines' pressure to reduce costs and restructure

The concentration of the market among a few large airlines continues. However, if the economy remains weak, the aviation market will face a number of challenges.

In particular, the numerous insolvencies in 2019, such as those of Germania, Thomas Cook, BMI Regional, Jet Airways or WOW Air, could not be offset, resulting in a sustained reduction in the number of flights offered in Germany. Most of the former medium-sized airlines operate in niche markets and from smaller regional airports. The routes offered were therefore largely withdrawn after the insolvencies and there was no direct impact from the takeover of routes by one of the major airlines. The latter development is mainly reflected at medium-sized and smaller airports in Germany.

In addition, the aviation industry itself struggled with a number of aircraft defects, so that not all available resources could be utilised. The grounding of the B737 MAX deprived the market of new growth momentum. In addition, technical faults repeatedly led to groundings, especially for the B737 NG and A220 aircraft types.

Other airlines are consolidating in view of their difficult business. Norwegian, for example, drastically cut back its flight programme in Germany starting with the winter flight schedule 2019/2020. In Germany, almost half of the routes offered have been withdrawn. Two airports will be completely removed from the programme. Within the Lufthansa Group, Eurowings' connections were thinned out during the year.

Since 26 September 2019, Condor has been operating under the protection of German insolvency laws (*Schutzschirmverfahren*) and has thus initially separated itself from the insolvency proceedings of the Group parent Thomas Cook. From this point on, the airline has flown significantly less.

Climate action plan and emissions trading system

Directive 2009/29/EC incorporates all aircraft that take off or land at an airport located in the EU in an emissions trading system and allocates certificates to the aviation industry (pollution rights), of which 85 percent have been assigned to the airlines involved. The remaining 15 percent are auctioned off.

From 2023, the EU emissions trading system will be replaced by ICAO's CORSIA system. While the current EU emission trading scheme only monitors the airlines within Europe, the new system will monitor overall CO₂ emissions of the airlines in ICAO Member States. CORSIA not only aims to reduce global CO₂ emissions in aviation, but also to ensure fair competition.

Grassroots movements, night curfew and the new Berlin Brandenburg Airport

In Germany, citizens continue to react in a sensitive manner to noise disturbance caused by air traffic. The night curfew at Frankfurt Airport, the referendum against the third runway at Munich Airport and the opening of the new airport in Berlin, which is not planned until the end of 2020, are dampening the drivers of growth for the national economy.

Air transport tax in Germany

In Germany, the law introducing an air transport tax (*Luftverkehrsteuergesetz* – LuftVStG) has been in force since the beginning of 2011. Airlines have to pay a graduated tax based on the distance to their destination for passengers who start their journey at a German airport.

From 1 April 2020, the air transport tax will increase by around 76 percent for domestic and EU flights and by around 43 percent for longer flights. The German Ministry of Finance (BMF) expects this to result in additional revenues of €785 million per year. The planned reduction in the value-added tax on rail tickets in Germany is to be financed with the additional revenue.

Tax payment (€)			
	2020***	2019**	2018*
Short-haul flights	13.03	7.38	7.46
Medium-haul flights	33.01	23.05	23.31
Long-haul flights	59.43	41.49	41.97

* applicable German ordinance: *Luftverkehrsteuer-Absenkungsverordnung (LuftVStAbsenkV) 2018*
 ** applicable German ordinance: *Luftverkehrsteuer-Absenkungsverordnung (LuftVStAbsenkV) 2019*
 *** under the Law on the Change to the Air Transport Tax (*Gesetz zur Änderung des Luftverkehrsteuergesetzes*) dated 12 December 2019

This passenger-based air transport tax increases the overall costs for the entire air transport industry. Airline tickets are likely to become more expensive from 2020, as airlines normally add the air transport tax to air fares. Compared to their foreign competitors, German airlines feel disadvantaged by the increase in air transport tax and criticise above all that short-haul flights are more affected than long-haul flights. This distorts competition.

Drones – integration and detection

DFS has continued to intensify its activities to achieve the safe and fair integration of unmanned aircraft systems (UAS) into German airspace and has made considerable advances in this regard. DFS continues to critically examine both the rewards and risks posed by unmanned aviation.

Fortunately, the number of drone-related hindrances reported by pilots in 2019 decreased. However, the absolute number of hindrances underlines the correctness and necessity of this work. Overall, 125 such occurrences were reported to DFS in 2019, of which 110 cases were in the vicinity of an airport. There were 158 cases in the year before, of which 125 were in the vicinity of an airport.

Together with Deutsche Telekom, DFS founded the joint venture Droniq GmbH and pushed ahead with the further development of the UAS traffic management (UTM) system with the core components of registration, approval, mission planning and optimisation, tracking and conflict avoidance. By providing the necessary connectivity and sensor systems, commercial

applications beyond the visual line of sight should be enabled. As part of the development and validation of various functionalities, numerous application projects were conducted with private and public partners in 2019 as well.

Through the development of UTM, DFS has also prepared itself for the impact of the new EU Regulation on the safe operation of UAS and the harmonisation of the operating regulations of the individual EU Member States. The Regulation drawn up by the European Aviation Safety Agency (EASA) entered into force in April 2019. Within the transitional periods set out, Germany has to implement the European provisions by 1 July 2020 and adapt the valid national drone regulation. This regulation covers the registration of drone operators, the identification of devices and the definition of banned and restricted zones for UAS.

In July 2019, the German Federal Ministry of Transport and Digital Infrastructure (BMVI) tasked DFS with developing and putting into operation a system for the detection of drones for all 16 (15, after the opening of Berlin Brandenburg Airport) of the designated international airports in Germany. In September 2019, DFS presented a roadmap describing the planned approach. In December 2019, the first tests were conducted to assess the performance of currently available systems.

The DFS drone app released in the middle of 2017 now has around 75,000 users and is making an important contribution to providing comprehensive information on the valid rules and regulations as well as the restrictions regarding the operation of drones.

2.2.2 Principle legal and regulatory influencing factors

Calculation of charges and definition of profit

In accordance with the European regulations for air navigation service providers, DFS switched the cost-base for calculating charges from German Commercial Code (HGB) to IFRS issued by the International Accounting Standards Board (IASB) as at 1 January 2007.

The regulatory conditions had to be adjusted to avoid volatility in the level of charges, in particular, by the revised IAS 19. Its revision in 2013 led to considerable fluctuations in equity capital. In a directive dated 12 December 2012, the Federal Supervisory Authority for Air Navigation Services (BAF) stipulated that the actual financing expense for occupational pensions should not be subject to the cost-efficiency targets of the performance plan, but is instead considered as a determined cost in the performance plan and therefore part of the cost-base. Charges take the length of service and interest cost into account in a mutatis mutandis application of IAS 19 as part of the performance plan. The uniform discount rate for the second reference period used to determine the obligation is based on the interest rate that can be earned on plan assets (3.54%). This rate reflects prudent commercial judgement. The differences between the obligation and plan assets (plan deficit/plan surplus) are allocated in a rolling fashion over the average remaining time to work of the staff (15 years) and are also taken into account in the following reference periods as a component of the charges (imputed model). Additional conservative assumptions for career, salary and inflation trends support the correct matching of the funding of occupational pensions and avoid random fluctuations in the cost-base for charges and therefore arbitrary charges for airspace users. A difference (funding deficit) between the obligation and the assets that is determined in the planning phase for the following reference period is distributed over 15 years and increases revenues and liquidity.

In addition, the regulatory authority has given DFS the right to spread the material measurement differences from the conversion from German Commercial Code (HGB) to IFRS for balance sheet items directly in equity, namely fixed assets (development costs, borrowing costs, depreciation and amortisation), pension obligations and other provisions (catch-up effects). The regulatory authority has also given DFS the right to invoice airspace users over a period of 15 years (until the end of 2022) for the ex-post financing requirements (Article 6 of Regulation (EC) No 1794/2006).

There is a divergence between the commercial accounting rules and the basis for determining revenues from air navigation charges. This divergence leads to a corresponding divergence in the expense line items. Since 2013, the assessment basis for tax has been based on the charges-related result in accordance with Section 31b(3) of the German Aviation Act (LuftVG). However, a corresponding regulation to determine the basis for the payment of dividends is still not in place.

Loss of half the registered capital (Section 49(3) of the Act Concerning Limited Liability Companies (GmbHG))

The Board of Managing Directors informed the Shareholder about the loss of half of the registered capital in the business year 2019. The tension between the regulatory requirements for determining charges on the one hand and ambitious performance requirements with their corresponding costs on the other hand does not currently allow DFS to offset substantial reductions in equity. In addition, the ongoing phase of low interest rates is putting earnings and equity under pressure against the background of existing pension obligations.

The Board of Managing Directors continuously monitors the effects of current business transactions, forecasts made at the end of the business year and the medium-term plan on the results and financial position of DFS.

Reference period 2 and outlook to reference period 3

The European Commission set the second reference period (RP2) for the period from 2015 to 2019, combined with binding European targets for the key areas of safety, capacity, cost-efficiency and the environment, as well as a financial incentive system for the key area of capacity.

The targets of the performance plan that was finally approved restricted the economic performance of DFS. DFS took a critical view of the cost-efficiency targets laid down in the FABEC performance plan for reference period 2 (RP2). The ability of the company to act was restricted and determinations, such as on the return on equity, do not adequately reflect the risks under which the company operates.

As part of the preparations for the third reference period, DFS submitted proposals to the German Federal Supervisory Authority for Air Navigation Services (BAF) at the end of 2019 to establish a performance plan for the whole period of reference period 3 (RP3) from 2020 to 2024. These proposals had been agreed with the air transport associations representing the vast majority of air transport companies operating in Germany – the German Airline Association (BDF) and the Board of Airline Representatives in Germany (BARIG). This is the first time that a broad consensus was reached in Germany on the provisions for the upcoming reference period – this is referred to as the national solution, or the negotiated solution.

DFS will continue to feel considerable pressure on costs and expected capacity performance in RP3.

Uncontrollable costs – costs exempt from cost-sharing

For reference period 2 from 2015 to 2019, Article 14(2a) of Regulation (EU) No 391/2013 allowed for the sharing of costs with airspace users for the costs that do not lie within the control of air navigation service providers. Despite the fact that the first reference period is over, the assessment, identification and determination of these uncontrollable costs has still not been made because the European Commission has not yet supplied an unequivocal determination.

DFS has therefore already recognised provisions in the respective financial statements for obligations arising from "uncontrollable costs". Within the scope of the so-called national solution for RP3 from 2020 to 2024, DFS will take this position into account for RP3 to reduce charges.

In RP3, the mechanism of uncontrollable costs will be continued in a similar form through the provisions of Article 28 of Regulation (EU) No 2019/317. However, in future, airspace users will be consulted about the calculated costs on an annual basis and these costs will be determined by the Member State.

European funding programme

The EU plans to provide €2.5 billion of grant funding for targeted investment in the ATM (air traffic management) sector through its Connecting Europe Facility (CEF) until the end of 2023. (This includes the new EU financing programme from 2021; currently in preparation.) DFS participates in this programme and currently receives grant funding of a maximum of €226.8 million until the end of 2023. However, under Article 14(2)(13) of Regulation (EU) No 409/2013 (Common Projects), such grant funding counts as 'other revenue' as set out in Article 2(k) of Regulation (EU) No 1794/2006 and should be used to reduce air navigation charges. DFS supports regulation at the European level that would provide a real monetary incentive for air navigation service providers to become involved in these programmes.

Exemption from the levy imposed under the German Renewable Energy Sources Act (EEG)

In a letter dated 14 November 2019, Amprion GmbH (Amprion), as the responsible transmission system operator for the subsidiary DFS Energy, communicated its legal opinion that the prerequisites for an exemption from the EEG levy for the electricity generated decentrally and consumed by DFS and the Paul Ehrlich Institute (PEI) are not met. The legal opinion of Amprion is that there is no exempt own generation/supply of electricity and DFS Energy has no right to refuse performance under Section 104(4) EEG 2017.

In the event of a lawsuit by Amprion, DFS and PEI will probably be required to pay the EEG levy on the electricity volumes subject to the EEG levy retroactively from June 2014. As at 31 December 2019, the EEG levy that might then be due would amount to approximately €11.3 million (plus interest). Of this amount, approximately €8.0 million is attributable to DFS and approximately €3.3 million to the PEI.

DFS Energy therefore consulted a law firm specialising in energy law to assess the legal risk for DFS and PEI as to whether the conditions for the exemption from the EEG levy, and thus the right to refuse performance within the meaning of Section 104(4) EEG in favour of DFS and PEI, had not been met and whether the EEG levy would have to be paid retroactively for the past and on an ongoing basis for the future. In the opinion of the law firm, the chances of winning in the final round in the event of a legal dispute are measurably higher than the risks of losing.

If, in the event of a court decision, DFS Energy is nevertheless required to pay the EEG levy for the past and for the future, DFS Energy can pass on these costs to its energy customers DFS and PEI under the operator model. Both DFS and PEI have expressly confirmed the relevant contractual provisions to DFS Energy recently.

In view of the above-mentioned prospects of winning in the final instance in the event of a legal dispute, DFS does not currently consider it necessary to make provisions in the balance sheet for this eventuality.

2.2.3 Forecast/actual comparison

Forecast/actual comparison 2019			
	Actual as at 31 Dec 2018	Forecast for 2019	Actual as at 31 Dec 2019
Service units	En-route services: 14.93 million Terminal services: 1.47 million	Moderate, but stable growth (DFS forecast)	En-route services: 15.13 million Terminal services: 1.49 million
Revenues (total)	€1,107.1m	Revenues at the prior-year level	€1,109.5m
Revenues (commercial business) (total operating revenues and income)	€65.2m (€66.8m)	Increase in double-digit million euro range*	€87.1m (€91.1m)
Depreciation and amortisation	€117.2m	Depreciation and amortisation under the prior-year level	€104.1m
Earnings (total)	-€30.1m	Negative earnings at the level of the previous year	€35.6 m
Earnings (commercial business)	-€4.6m	Losses in the single-digit million euro range**	€1.9m
New ATC trainees (of which DFS share)***	135 (115)	Boosting of ATC training	142 (126)

* through the expansion of the commercial business.

** due to higher (start-up) costs from the expansion of commercial business.

*** start of theoretical basic training at the DFS Air Navigation Services Academy. As of 31 December 2019, a total of 330 people were undergoing multi-year air traffic controller training Group-wide, of these 295 were at DFS (see also section 4).

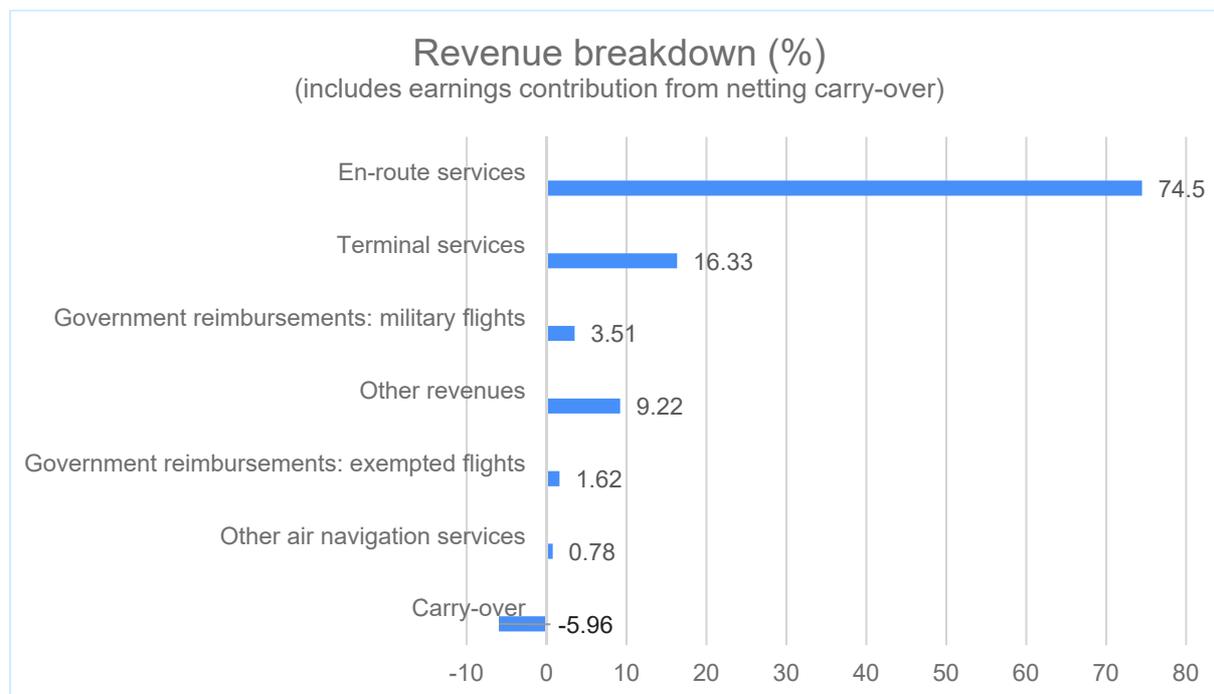
More information on earnings can be found in section 2.5.

2.3 Results of operations

2.3.1 Revenues

In the business year 2019, the DFS Group generated revenues of €1,109.7 million (previous year: €1,107.1 million), slightly above the previous year's level.

Within certain limits, the Group is exposed to rewards and risks resulting from the development of air traffic (see section 3.1.3).



Revenues from air navigation services decreased slightly from €1,027.7 million to €1,007.4 million. This is after netting the carry-over from previous years (€71.3 million) and the carry-over 2019 (minus €137.4 million). Revenues from en-route and terminal services declined despite the slightly higher number of service units due to the lower unit rates from economic regulation (see section 3.1).

Revenues from en-route charges (€m)

	2019	2018	2017	2016	2015
Total	826.8	867.4	859.8	899.3	962.3
Compared with previous year (%)	-4.7	+0.9	-4.4	-6.5	+20.1

These revenues were exclusively generated by DFS.

Revenues from terminal charges (€m)

	2019	2018	2017	2016	2015
Gross	182.2	185.4	182.5	211.5	233.8
Reimbursements paid	(1.0)	(1.0)	(0.9)	(0.7)	(0.7)
Net	181.2	184.4	181.6	210.8	233.1
Compared with previous year (net, in %)	-1.7	+1.5	-13.9	-9.6	+0.5

These revenues were exclusively generated by DFS.

Revenues from government reimbursements (€m)

	2019	2018	2017	2016	2015
Military operational air traffic	38.9	44.0	43.9	61.6	61.0
Exempted flights	18.0	18.0	18.0	6.5	6.5
Total	56.9	62.0	61.9	68.1	67.5
Compared with previous year (%)	-8.2	+0.2	-9.1	+0.9	+2.9

These revenues were exclusively generated by DFS. The exempted flights relate to en-route flights under visual flight rules.

Revenues from other air navigation services (€m)

	2019	2018	2017	2016	2015*
Aeronautical publications	4.4	4.3	4.3	4.2	7.0
Flight inspection services	3.5	3.6	3.8	2.7	2.2
Other air navigation services	0.7	0.7	0.5	1.4	0.9
Total	8.6	8.6	8.6	8.3	10.1
of which commercial business	4.4	4.3	4.2	4.2	3.8
Compared with previous year (%)	0.0	0.0	+3.6	-17.8	+188.6

* Figures adjusted

Other revenues (€m)					
	2019	2018	2017	2016	2015*
Total	102.3	79.4	71.6	52.5	37.7
of which commercial business	82.5	60.9	62.3	48.7	37.7
Compared with previous year (%)	+28.8	+10.9	+36.4	+39.3	+82.1

* Figures adjusted

The Group generates other revenues primarily from air traffic control services at nine German regional airports and at London Gatwick and Edinburgh airports, from consultancy and staffing services, apron management service and training services.

2.3.2 Other operating income

Other operating income (€m)					
	2019	2018	2017	2016	2015*
Total	52.8	53.4	59.4	46.6	33.3
of which commercial business	5.8	1.9	1.5	0.5	0.9
Compared with previous year (%)	-1.1	-10.1	+27.5	+39.9	-5.7

* Figures adjusted

Material components:

- Project-specific funding by the European Commission (€26.7 million)
- Income from the qualified technological equipment (QTE) transaction, exchange rate gain (€8.8 million)
- Reversal of provisions (€10.7 million)
- Remaining (€6.6 million)

2.4 Principal expense categories

Employee expenses (€m)					
	2019	2018	2017	2016	2015*
Total	935.2	878.9	862.8	838.5	850.7
Wages and salaries	660.3	621.0	605.2	609.2	593.6
Social security costs and expenses for pensions and assistance	266.4	249.4	249.1	206.4	230.0
Costs of personnel belonging to the Federal Aviation Office (LBA)**	8.5	8.5	8.5	22.9	27.0
of which commercial business***	62.7	46.1	40.3	33.1	23.7
Share of total costs (%)	77.2	76.1	75.4	77.1	77.2
Compared with previous year (%)	1.4	+1.9	+2.9	-1.4	+5.9

* Figures adjusted

** Federal Aviation Office (LBA): The Federal Government had taken over the administration costs for the public service employees of the Federal Administration of Air Navigation Services still working at DFS amounting to €1 million per year.

*** This item contains allocated costs.

Interest of €85.9 million accruing from provisions for pensions and early retirement is charged to the financial result. The return on plan assets (€51.8 million) is credited to the financial result.

Other operating expenses (€m)					
	2019**	2018**	2017**	2016	2015*
Total	156.9	145.0	147.2	128.9	130.8
of which commercial business***	17.7	13.8	23.9	11.3	7.0
Share of total costs (%)	12.9	12.6	12.9	11.8	11.9
Compared with previous year (%)	8.2	-1.5	+14.2	-1.5	-1.4

* Figures adjusted

** From 2018, the item no longer contains the impairment losses on financial assets and contract assets as these must be separately disclosed in accordance with IAS 1(82). The disclosures for 2017 have been adjusted.

*** This item contains allocated costs.

Material components:

- Spare parts and maintenance (€54.0 million)
- Occupancy costs (€14.9 million)
- Costs of external personnel (€13.4 million)
- Rental and leasing (€6.6 million)
- Telecommunication costs (€9.4 million)
- Exchange rate losses from the QTE transaction (€9.0 million)
- Legal and consultancy costs (€7.3 million)
- Travel costs (€8.1 million)
- Other employee expenses (€12.9 million)
- Vehicle costs (€3.3 million)
- Insurance (€3.8 million)
- Remaining (€14.2 million)

Depreciation and amortisation (€m)					
	2019	2018	2017	2016	2015*
Total	104.1	117.2	116.3	108.9	109.6
of which commercial business	4.4	4.0	3.1	1.8	1.7
Share of total costs (%)	8.6	10.2	10.2	10.0	10.0
Compared with previous year (%)	-15.4	+0.8	+6.8	-0.6	+4.9

* Figures adjusted

Impairment losses on financial assets and contract assets (€m)					
	2019	2018	2017	2016	2015
Total	4.8	0.9	5.6	---	---
of which commercial business	---	---	---	---	---
Share of total costs (%)	0.4	0.1	0.5	---	---
Compared with previous year (%)	433.3	-83.9	---	----	---

The item shows the impairment losses on financial assets and contract assets previously disclosed under other operating expenses. These are mainly specific allowances and write-offs of receivables.

2.5 Group earnings

In 2019, the DFS Group generated net income of €35.6 million after a net loss of €30.1 million in the previous year.

Net income (€m)					
	2019	2018	2017	2016	2015*
Total	35.6	-30.1	30.8	86.6	123.6
of which commercial business	1.9	-4.6	2.2	1.2	4.7
Compared with previous year (%)	+218.3	-197.7	-64.4	-29.9	+254.2

* Figures adjusted

The earnings contain the costs reimbursed by airspace users for previous years of €59.0 million (previous year: €57.2 million) from the conversion of the cost-base for calculating charges from the German Commercial Code (HGB) to IFRS as at 1 January 2007 (catch-up effects). They also contain costs of €51.2 million (previous year: €51.7 million) from the application of the imputed model for occupational pension (closing the deficit, see section 2.2.2) within the scope of the introduction of regulated charges as at 1 January 2012. In addition, they contain capitalised development costs of €20.3 million (previous year: €17.7 million) as well as grant funding of €26.7 million (previous year: €26.5 million). The carry-over from previous years (€71.3 million) had a positive impact on earnings, while the carry-over for the business year 2019 (minus €137.4 million) had a negative impact on earnings.

Earnings before taxes (€m)	
Net income	35.6
Taxes on income and gains	-0.3
EBT	35.3

Total operating revenues and income were slightly higher than in the previous year. Group earnings were in positive territory – despite noticeably higher expenses – due to the strong financial result in connection with investment performance.

DFS also took into account the additional income from charges from 2017 to be offset in the charges for users in 2019 (see section 2.2.2).

The commercial business recorded net income for the year of €1.9 million (previous year: net loss of €4.6 million).

A net loss of €0.8 million was attributable to the minority shareholder of the Droniq subsidiary.

Overall, the Group earnings were impacted by material special items.

2.6 Assets and financial position

2.6.1 Capital expenditure

The DFS Group invests in a targeted manner in preserving and developing the required infrastructure. Regulations and standards from ICAO, EUROCONTROL and the EU are taken into consideration. The safety of air traffic plays a decisive role when it comes to decisions on capital expenditure. Against this background, capital expenditure amounted to €120.5 million (previous year: €109.0 million) in the business year 2019. This included capitalised rights of use from the first-time application of IFRS 16 Leases of €13.6 million (see Notes 4.1.1 and 18).

The principal projects with the highest share of capital expenditure are:

iCAS programme – interoperability through European collaboration Centre Automation System

DFS launched the iCAS programme (iTEC Centre Automation System) to consolidate all projects, sub-projects and individual measures for the development of iCAS, the future air traffic control system at all DFS control centres. The programme comprises both concrete procurement and development measures to provide iCAS at the DFS control centres as well as a variety of bilateral and multinational cooperation measures at a European level. The iCAS programme ensures that the multinational initiatives to shape the future European air traffic management system and the development of iCAS are conducted in a coordinated manner and that the interests of DFS are suitably taken into account. The future iCAS air traffic services system for control centres will in particular meet the interoperability requirements of the SES regulations. The iCAS programme is given grant funding from the European Commission as part of the Connecting Europe Facility (CEF) infrastructure fund.

Following the successful launch in the Karlsruhe control centre at the end of 2017, the programme has the following additional objectives:

- Step-by-step introduction of iCAS at the control centres for lower airspace: Munich (beginning of 2022), Bremen (beginning of 2023) and Langen (end of 2023 / beginning of 2024).
- Harmonisation of ATS systems at the DFS control centres and creation of system and technical conditions to optimise the maintenance organisation of control centres.
- Creation of the technical system platform to implement the operational concepts of the future with the goal of boosting performance (SESAR, FABEC), cooperation and cost splitting with other ANSPs in the iCAS realisation and use.

DFS has thus taken the first step on the path of harmonising the systems used within DFS and subsequently in Europe.

Radio Site Upgrade and Modernisation (RASUM) 8.33

DFS is equipping 95 radio stations for the 8.33 kHz channel spacing requirements in lower airspace, including all necessary structural and infrastructural measures. The project creates urgently needed radio frequencies and implements the conclusion taken by the ICAO European Air Navigation Planning Group (EANPG) 48 dated November 2006 and Regulation (EU) No 1079/2012. The volume of capital expenditure amounts to €100 million over the entire period.

Public-private partnership (PPP) Kaufbeuren – provision of military air traffic control training of the Bundeswehr in Kaufbeuren by DFS

As part of this measure, DFS laid the foundations for the provision of military air traffic control training of the Bundeswehr in Kaufbeuren, Germany, through its subsidiary Kaufbeuren ATM Training. This includes the provision of building infrastructure (accommodation and academy buildings), simulator infrastructure and administrative office communications infrastructure (see section 3.2.1). The construction phase of the buildings and the move to the new campus site were successfully completed in the third quarter of 2019. The official opening, including full simulator operations and the accommodation of the course participants by Kaufbeuren ATM Training, took place on 21 October 2019. Since then, Kaufbeuren ATM Training has been in the operational phase.

GS2 Voice Communication System (VCS) intercom system in Munich

DFS is renewing the existing intercom systems at all control centres for lower airspace, at all DFS towers and at numerous external communication partners, such as the apron management service and the regional airports.

Construction of the new logistics building

Since the end of 2019, DFS has been constructing a new building on the campus in Langen for central logistics and maintenance. The opening is scheduled for 2021.

In the business year 2019, assets under construction worth a total of €21.2 million were completed (previous year: €20.0 million).

With these projects, the DFS Group secures its position as a reliable partner for aviation.

2.6.2 Balance sheet structure

Application of the new IFRS 16 standard

The first-time application of IFRS 16 Leases primarily relates to the use of land and buildings for the operation of air traffic control equipment and led to the recognition of rights of use of €13.6 million as of 1 January 2019 and amortisation of €2.1 million. The residual value as at 31 December 2019 was therefore €11.5 million. Correspondingly, lease liabilities of €25.3 million were recognised. After intra-year index adjustments, principal repayments and interest effects, the residual liabilities amounted to €23.1 million as of 31 December 2019. These were divided into non-current liabilities (€20.7 million) and current liabilities (€2.4 million). A detailed description can be found in Notes 4.1.1 and 18.

Balance sheet 2019

In 2019, the balance sheet total increased by 3.0 percent over the previous year to €2,222.1 million (previous year: €2,157.9 million).

Assets

Non-current assets rose slightly by 2.1 percent from €806.2 million to €823.2 million, while current assets increased by 3.5 percent from €1,351.7 million to €1,398.9 million.

The structure of non-current assets remained virtually unchanged compared with the previous year, while there were two counteracting effects within the structure of current assets. While liquid funds decreased by around €88.5 million, investments in securities increased by around €81.8 million.

Trade receivables remained basically stable, while tax assets increased by 205.4 percent from €26.1 million to €79.8 million, mainly due to the transfer of a fund asset.

Equity and liabilities

Equity changed noticeably by 113.3 percent from minus €665.5 million to minus €1,419.2 million. The remeasurement of the net defined benefit liability (minus €793.5 million, OCI) had a significant negative impact, while the net income for the year (€35.6 million) slightly offset this effect.

Non-current liabilities rose by 27.0 percent from €2,502.5 million to €3,178.6 million. This was primarily attributable to the rise in the net liability from pension obligations, chiefly from actuarial losses of €793.5 million. The allocation of additional plan assets compensated for this to a limited extent. Based on the prior-year figures, the net liability (difference between obligation and plan assets) rose by 36.5 percent to €2,751.8 million (previous year: €2,016.6 million) with a considerably lower discount rate (1.1%; previous year: 1.8%) and stable salary trend (2.5%).

A maturity reclassification (€87.5 million) of debenture loans reduced non-current liabilities, while the first-time application of IFRS 16 and the associated recognition of lease liabilities (€20.7 million, non-current portion) increased non-current liabilities.

Current liabilities rose by 44.2 percent from €320.8 million to €462.8 million. Other provisions increased by €51.5 million, mainly as a result of the carry-over (current portion) to be offset with airspace users in the business year. A maturity reclassification (€87.5 million) increased it commensurately.

Current effects				
	2019 (€m)	2018 (€m)	Change (€m)	Change (in %)
Balance sheet total	2,221.1	2,157.9	64.2	3.0
Intangible assets	206.4	191.8	14.6	7.6
Property, plant and equipment	499.3	499.9	-0.6	-0.1
Property (financial investment)	0.7	0.7	0.0	0.0
Financial assets	24.4	24.9	-0.5	-2.0
Trade receivables	0.1	0.0	0.1	100
Other assets	76.5	75.3	1.2	1.6
Deferred tax assets	15.8	13.6	2.2	16.2
Non-current assets	823.2	806.2	17.0	2.1
Trade receivables	152.2	157.7	-5.5	-3.5
Contract assets	2.4	7.1	-4.7	-66.2
Other assets	32.8	23.2	9.6	41.4
Inventories	6.2	5.3	0.9	17.0
Financial assets	758.9	677.2	81.7	12.1
Cash and cash equivalents	366.6	455.1	-88.5	-19.4
Tax assets	79.8	26.1	53.7	205.7
Current assets	1,398.9	1,351.7	47.2	3.5
Equity	-1,419.2	-665.5	-753.7	113.3
Pension provisions	2,751.8	2,016.6	735.2	36.5
Other provisions	217.2	208.6	8.6	4.1
Financial liabilities	152.8	226.7	-73.9	-32.6
Trade payables	0.3	0.6	-0.3	-50.0
Other liabilities	25.6	19.1	6.5	34.0
Income tax obligations	30.9	30.9	0.0	0.0
Non-current liabilities	3,178.6	2,502.5	676.1	27.0
Other provisions	234.7	183.2	51.5	28.1
Financial liabilities	98.5	9.9	88.6	894.9
Trade payables	25.7	30.2	-4.5	-14.9
Contract liabilities	2.3	1.4	0.9	64.3
Other liabilities	101.5	96.0	5.5	5.7
Income tax obligations	0.1	0.1	0.0	0.0
Current liabilities	462.8	320.8	142.0	44.3

Balance sheet indicators			
	2019	2018	2017
Net financial indebtedness (€m)* (Financial liabilities – liquid funds)	-874.2	-895.6	-973.8
Leverage ratio (%) (Net financial indebtedness / balance sheet total)	-39.3	-41.5	-43.3
Asset intensity (%) (Non-current assets / balance sheet total)	37.1	37.4	35.5

* A minus sign means that there is an overcompensation from liquid funds.

Balance sheet indicators when fully considering catch-up effects from the conversion to IFRS and the deficit			
	2019	2018	2017
Net financial indebtedness (€m)* (Financial liabilities – liquid funds)	-874.2	-895.6	-973.8
Leverage ratio (%) (Net financial indebtedness / balance sheet total)	-17.6	-21.6	-23.7
Asset intensity (%) (Non-current assets / balance sheet total)	16.6	19.4	19.5

* A minus sign means that there is an overcompensation from liquid funds.

In Note 39, a detailed reconciliation can be found of the equity as at 31 December 2019 to the charges-related equity taking consideration of catch-up effects from the conversion to IFRS and the procedure approved for the treatment of occupational pensions by the BAF (see section 2.2.2).

2.6.3 Liquidity

2.6.3.1 Financial management

Financial management at the Group is responsible for securing and supporting the statutory obligation of DFS and, at the same time, fostering the competitiveness of the commercial business. DFS optimises its performance through an appropriate equity and debt structure, the economical use of equity capital, an optimised use of debt and the planning and control of cash flows.

Financing is carried out primarily by drawing on the cash inflows from operating activities and on funds from a money and capital market programme. Furthermore, there are special items impacting assets that have a temporarily favourable effect on liquidity.

Group Treasury plans and controls the level of cash and cash equivalents and the procurement of funds. It incorporates subsidiaries in the flow of funds by means of intra-Group liquidity offsetting (cash pool agreements). Funds are collected and centrally controlled where legally allowed and commercially sensible. The financing requirements of subsidiaries are satisfied by intra-Group settlement accounts and loans. The DFS Group aims to achieve a balanced financing structure and holds, despite the negative interest rate

environment, liquid reserves to effectively meet unexpected changes in the environment and market (see section 6.2.2).

Business dealings with a select group of core banks are conducted using uniform standards and existing reciprocal cash flows are continuously improved.

The DFS Group finances its non-current liabilities congruently with debenture loans. Short-term liquidity is covered by means of a multi-currency commercial paper programme. This financing form was not used in the business year. Appropriate liquidity from short-term demand deposits and from fund assets not protected against insolvency ensures the solvency of the DFS Group.

With its money and capital market programme, the DFS Group attracts both national and international investors. These investors base their investment decisions and price fixing on the credit rating of each debtor. To support their decision-making process, DFS has its creditworthiness rated by means of standardised credit ratings from a credit rating agency according to internationally uniform and consistent procedures. The rating agency Standard & Poor's confirmed for DFS the ratings for 2019 in combination with its Shareholder for both their short- and long-term ratings (AAA/A-1+ stable).

At year-end 2019, the issued volume had a nominal value of €197.5 million from debenture loans with a remaining term of up to five years.

The average weighted interest rate of the debenture loans amounted to 2.618 percent at the balance sheet date.

2.6.3.2 Group cash flow statement

Cash and cash equivalents at year-end are made up as follows:

Cash and cash equivalents (€'000)			
	2019	2018	2017
Cash inflow (+) / cash outflow (-)			
Operating activities	77,239	-198,326	265,897
Investing activities	-118,029	-110,907	-108,894
Financing activities	34,081	201,127	139,111
Changes impacting cash flow	-6,709	-108,106	296,114
Cash and cash equivalents at the beginning of the year	1,132,255	1,240,361	944,247
Cash and cash equivalents at the end of the year	1,125,546	1,132,255*	1,240,361*

* Contains fund assets not protected against insolvency

Additional information can be found in the cash flow statement and in Note 35. No dividend was paid out to the Shareholder in the business year 2018.

2.7 Overall assessment on the economic situation

The results and financial position were influenced primarily by the legal environment, economic regulation, catch-up effects, grant funding, capitalisation of development costs, the stable growth in air traffic, the continuing low interest level due to the development on the capital markets as well as the measures taken by the Board of Managing Directors to limit costs.

In the business year 2019, revenues generated by the DFS Group came in only slightly above the previous year's level despite the slight increase in service units because the unit rates were lowered again as a result of economic regulation. Net income came in at €35.6 million. However, net income was significantly influenced by the strong financial result, catch-up effects and regulatory effects (carry-over as well as the imputed model for closing the deficit in occupational pensions). DFS is strengthening the refinancing of occupational pensions through a higher commitment to asset forms with a more attractive risk/return ratio.

3 Segment reporting

3.1 Regulated business

3.1.1 Control Centre division

Service unit

In the Control Centre division, a service unit is computed as the square root of the weight factor multiplied by the distance factor. The economic value of each flight conducted is thus taken into account and the value of the air traffic control service performed is considered by the legislator when establishing the relevant air navigation charges.

Definition of service unit:

$$\text{En-route services: } \sqrt{\frac{\text{max. take-off weight in tonnes}}{50}} \times \frac{\text{distance in km}}{100}$$

The amount to be paid by the airspace user is given by multiplying the service unit by the en-route unit rate.

Service units – en-route services		
	2019	2018
Total	15,132,422	14,931,581
Compared with previous year (%)	+1.3	+4.4

In 2019, the number of service units rose by roughly 1.3 percent over the previous year. This was 13.2 percent higher than the revised performance plan, which forecast 13,365,000 service units for 2019. The year 2019 was marked by a significant slowdown in the growth of traffic over the course of the year. In the first quarter 2019, the loss of Air Berlin routes from the previous year was being offset so that correspondingly high growth rates were achieved compared with the previous year. From the second quarter 2019, traffic growth was slow with weak overall economic growth. In particular, it was not possible to offset the high number of insolvencies in 2019, such as those of the German holiday airline Germania, the UK airline BMI Regional or the Thomas Cook travel group. Air transport is impacted not only by the overall economic environment, but also by sector-specific challenges.

The national en-route unit rate comprises air-traffic-related cost elements of DFS, the German Meteorological Service (DWD), EUROCONTROL, the Maastricht Upper Area Control Centre (MUAC) and other national bodies, such as the German Federal Ministry of Transport and Digital Infrastructure (BMVI) and the Federal Supervisory Authority for Air Navigation Services (BAF).

The national en-route unit rate is calculated by taking the determined costs for the year in question as defined in the performance plan plus the adjustments defined in Regulation (EU) No 2019/317 and dividing by the service units based on the basic forecasts of EUROCONTROL's Statistics and Forecast Service (STATFOR) for the year in question.

En-route unit rate (€)						
	2020	2019	2018	2017	2016	2015
Total	63.61	63.63	67.07	69.36	82.59	90.15
DFS share	54.39	54.63	58.09	60.10	66.68	74.56
Compared with previous year (total, in %)	0.0	-5.1	-3.3	-16.0	-8.4	+16.6

The EU Regulation on the common charging scheme for air navigation services contains compensation mechanisms to partly offset losses in revenues as a consequence of deviations in traffic volumes as well as an inflation adjustment. The decrease in the unit rate in 2019 was primarily attributable to the carry-over from the above-mentioned compensation reasons. In 2020, the unit rate will remain almost constant on the basis of the provisions in the performance plan. The DFS share of the unit rate for 2020 sank by 0.4 percent over the previous year, while the share of the unit rate for en-route services remained at around 86 percent.

3.1.2 Tower division

Service unit

For terminal services, a service unit is the quotient obtained by dividing by 50 the maximum take-off weight, expressed as a figure taken to two decimal places, to the power of 0.7. The calculation is applied consistently at all 16 designated international airports in Germany.

Definition of service unit:

$$\text{Terminal services: } \left(\frac{\text{max. take-off weight in tonnes}}{50} \right)^{0.7}$$

The amount to be paid by the airspace user is given by multiplying the service unit by the unit rate for terminal services.

Service units – terminal services		
	2019	2018
Total	1,492,294	1,474,074
Compared with previous year (%)	+1.2	+3.5

The number of service units rose by 1.2 percent over the previous year, which is roughly 7.2 percent over the revised performance plan. Domestic traffic in particular saw a decline in the number of flights on offer in Germany in the course of the year. The latter development is mainly reflected at medium-sized and smaller airports in Germany.

The unit rate for terminal services comprises air-traffic-related cost elements of DFS, the German Meteorological Service (DWD) and other national bodies, such as the German Federal Ministry of Transport and Digital Infrastructure (BMVI) and the Federal Supervisory Authority for Air Navigation Services (BAF). It is calculated by taking the determined costs for the year in question as defined in the performance plan plus the adjustments defined in

Regulation (EU) No 317/2019 and dividing by the service units based on the basic forecasts of EUROCONTROL's Statistics and Forecast Service (STATFOR) for the year in question.

Terminal unit rate (€)						
	2020	2019	2018	2017	2016	2015
Total	126.29	124.34	127.87	130.59	159.23	181.62
DFS share	122.70	121.40	125.18	127.80	151.31	173.28
Compared with previous year (total, in %)	+1.6	-2.8	-2.1	-18.0	-12.3	-1.2

The decrease in the unit rate in 2019 was primarily attributable to the carry-over from over-recoveries in 2017 due to traffic deviations and inflation adjustments. Based on the provisions of the performance plan, the unit rate in 2020 will increase by 1.6 percent over the previous year, while the DFS share of the unit rate for terminal services will decrease to approximately 97 percent.

3.1.3 Results of operations

Results (€m)		
	2019	2018
Total operating revenues and income	1,089.9	1,111.1
Total expenses	-1,122.8	-1,084.8
EBIT	-32.9	26.3
Financial result	63.6	-52.8
Income taxes	3.0	1.0
Net income (previous year: loss)	33.7	-25.5

More information on segment reporting can be found in Note 34.

The changeover from full cost recovery to charges based on performance for the Control Centre division (since 2012) and the Tower division (since 2015) has had a material impact on cost structures. Savings or additional expenses are no longer passed on in the following periods but directly impact the earnings of DFS. Currently, there are still issues concerning interpretation and application which could influence the future development of the company's economic situation. From the point of view of DFS, there are a small number of measurement, accounting and charging issues which have still not been unequivocally resolved since the date of the transition (31 December 2011 / 1 January 2012). The regulatory authority and DFS continue to work on the contentious issue of drawing up a binding catalogue of qualifying uncontrollable costs. Such costs will have to be borne in full by airspace users.

For the Control Centre division (since 2012) and the Tower division (since 2015), the regulatory situation has split the risks and rewards resulting from the differences between planned and actual traffic volume between the airspace users and DFS. If defined thresholds are exceeded, DFS is authorised and obliged to return or demand any over- or under-recoveries (carry-over).

Risk/reward transfer from deviation in traffic volume		
Deviation in traffic volume (v)	DFS share	User share
$v \leq 2.0\%$	100.0%	---
$2.0\% < v \leq 10.0\%$	30.0%	70.0%
$v > 10.0\%$	---	100.0%

3.2 Commercial business

3.2.1 Business activities

The main focus of the (non-regulated) commercial business is on providing air traffic control services at nine German regional airports and two UK airports, the sale of aviation-related products and publications, the training of military air traffic control personnel, the international consulting and project business as well as the provision of support services for the operation of drones. Since 2019, it has been divided into five strategic business areas.



Aeronautical data, engineering & systems

The strategic business area "Aeronautical data, engineering & systems" comprises the supply of radar, position and flight plan data, and access to radiotelephony frequencies of the air navigation services for airport operators and airlines in Germany. In addition, technical air navigation services at German regional airports as well as worldwide product engineering (troubleshooting and system maintenance) for installed air traffic control systems are offered and carried out.

However, ATS systems are also being developed and offered worldwide to a much greater extent. Due to growing demand and a good level of expertise, DFS Aviation Services will focus more strongly on this segment and will drive the development of cloud, remote and simulation-enabled ATS systems for tower and approach control as well as fallback solutions for en-route systems.

The services provided to airport operators and airlines in Germany relating to radar, position and flight plan data, and access to radiotelephony frequencies of the air navigation services were steady and remained strong. The market share is almost 100 percent.

A two-year system supply contract with Dubai Air Navigation Services (DANS) was concluded for the expansion of the existing air traffic control system and the development of further functionalities. It is to be supplemented by a maintenance contract.

The Group also produces aeronautical charts and publications and other aeronautical information in paper and electronic form (aviation-related products and publications), and sells them together with technical devices for flight preparation and flight operations.

Air traffic services & apron

DFS Aviation Services provides air traffic services (ATS) at nine German regional airports and, through its subsidiary Air Navigation Solutions Ltd. (ANS), at London Gatwick and Edinburgh airports, as well as apron management services at German airports. These services are provided by DFS controllers but, as they are not part of the sovereign mandate of DFS, they are invoiced to DFS Aviation Services, and DFS Aviation Services bills the airports.

Furthermore, DFS Aviation Services provides the aerodrome flight information service (AFIS) at one German airport.

This business area also includes services, such as remote tower control as a service. This involves complete remote tower solutions with the associated consulting and training services. For this purpose, a joint venture company – FREQUENTIS DFS AEROSENSE GmbH (Aerosense) – was founded with the system supplier Frequentis AG, Vienna, Austria. The joint venture is also headquartered in Vienna, Austria, and DFS Aviation Services has a shareholding of 30 percent. The company has been active on the market since the end of 2018.

The demand for this remote tower control (RTC) service and the associated new technology remains very high.

Air traffic at the regional airports where DFS Aviation Services operates

In view of the general increase in aircraft movements in Germany, air traffic at the regional airports served by DFS Aviation Services developed satisfactorily, rising by 5.1 percent.

Air traffic control at the regional airports where DFS Aviation Services operates

The successful takeover of the aerodrome flight information service (AFIS) at Emden Airport on 1 October 2018 met with a positive response from the market. DFS Aviation Services is in contact with other potential customers for the takeover of AFIS and sees potential synergies from this.

The German Aerospace Centre (DLR) has acquired Cochstedt Airport and made the decision to set up a national drone test centre there over the next few years. To this end, air traffic services are to be gradually made available again. DFS Aviation Services is therefore currently in negotiations with DLR to provide this service. Based on the current contractual situation, DFS Aviation Services will continue to provide limited services until 31 March 2020.

DFS Aviation Services coordinates and invoices the provision of apron management services by DFS at 12 of the 16 designated international airports in Germany.

Air navigation services at Gatwick Airport

Gatwick remains the second-largest airport in the United Kingdom as measured by passenger volume and has more than 280,000 flight movements each year. It is considered the busiest single-runway airport in the world. From Gatwick, connections to some 230 destinations in over 70 countries are served. It counts more than 50 airlines as customers, which transported more than 46 million passengers.

Air Navigation Solutions handled the traffic volume of up to 950 flight movements per day safely. This marks a new record for a single-runway airport.

Air navigation services at Edinburgh Airport

Edinburgh is the largest airport in Scotland with more than 130,000 flight movements and a record number of more than 14 million passengers. It is used by 38 airlines, which fly to 157 destinations. Air Navigation Solutions has been providing air navigation services at Edinburgh Airport since 1 April 2018.

Consultancy

The strategic business area "Consultancy" encompasses all consulting services on air traffic control issues for air navigation service providers, airport operators, airlines as well as supervisory authorities and the military. The consulting services for remote tower customers as well as the provision of personnel to render services related to the service portfolio of DFS Aviation Services are also included here.

It serves a large market worldwide, albeit in a very strong competitive environment.

DFS AVIATION SERVICES BAHRAIN Co. W.L.L. (DAS Bahrain), which was founded in December 2018 and is based in Manama, Bahrain, has been providing the Bahraini air navigation service provider with suitably qualified personnel since 1 January 2019. As expected, business developed very well and generated corresponding contributions to earnings through additional local consulting services.

Revenues increased further in 2019. The earnings situation is satisfactory, but will continue to improve as revenues rise.

Aviation training services

The strategic business area "Aviation training services" encompasses all certification and non-certification courses for basic, rating and proficiency training for tower services as well as multi-runway and safety management courses. These courses are provided for customers from all over the world.

The business area is being progressively expanded, as there is customer demand for these services. However, the DFS Academy was unable to provide DFS Aviation Services with the desired capacity due to the prioritised, higher level of training set aside for DFS air traffic controllers. This meant that the company did not boost revenue growth to the desired extent. DFS Aviation Services therefore plans to build up its own training capacity.

Training of military air traffic control personnel

In 2019, Kaufbeuren ATM Training finalised the integration phase of the public-private-partnership project (air traffic control training of the Bundeswehr in Kaufbeuren), taking over responsibility for the full operational and on-schedule training of military air traffic control personnel in Kaufbeuren. The training takes place using the contractually agreed simulator and training infrastructure. A comprehensive quality management system has been established and is actively being used.

All of the courses requested and commissioned by the Bundeswehr in 2019 were carried out in accordance with the service level agreement at, or above, the quality level contractually agreed.

Since 2017, R. Eisenschmidt has been authorised to develop, produce and market products and services for the training of pilots, including pilots of unmanned aircraft systems.

UTM services & systems, including UAS training services

In 2018, DFS International Business Services took a stake of 23.6 percent in Unifly NV, Belgium. It currently holds 22.8 percent. Unifly is a software company and one of the global leaders in UTM solutions (UAS (unmanned aircraft systems) traffic management). The investment in Unifly is the systematic continuation of the path to the future taken to integrate the UTM system into the ATM system.

Through its subsidiary DFS International Business Services, DFS founded the joint venture Droniq with Deutsche Telekom. Droniq is headquartered in Frankfurt am Main, Germany. The purpose of the company is the provision, marketing and sale of services and products for tracking, navigation, traffic control and data solutions based on mobile communications for unmanned aircraft systems (UAS). Operating activities were commenced on 7 May 2019, and the entry in the Frankfurt am Main commercial register was made on 29 May 2019.

The aim is to become the leading digital platform for unmanned aviation and to foster the development of a safe and sustainable airspace ecosystem for drones. Droniq is positioning itself as the central hub, offering all products and services related to drone flight from a single source. It unites expertise from air traffic control, aviation and mobile communications technology.

The development of the national and international UAS market points to a positive trend for the future. According to current figures from a study by the German Unmanned Aviation Association (VUL), the commercial drone market in Germany will grow by approximately 183 percent to approximately 68,000 drones between 2019 and 2023. The large number of commercial applications of drones, such as route and pipeline inspection, construction progress monitoring and infrastructure surveying, shows the great potential for companies in a wide range of industries to increase efficiency and quality. At the same time, the use of drones has a high economic benefit for the protection of civil aviation as well as critical and security-relevant infrastructure.

Droniq started its business activities in 2019. The positive market reception from other market participants, the increasing number of UAS complementary products and the high interest in Droniq partnerships confirm the market potential and the market growth projected for Droniq.

Droniq's management assesses the company's economic situation as good. Droniq's medium-term financing is secured by appropriate equity capital and financing commitments from the shareholders.

In accordance with Droniq's strategy, the organisational, legal and technical foundations for implementing the business model have been created and the sales and marketing strategy has been aligned with the overall corporate strategy.

3.2.2 Results of operations

Results (€m)		
	2019	2018
Total operating revenues and income	91.1	66.8
Total expenses	-89.2	-69.7
EBIT	1.9	-2.9
Financial result	1.8	-1.2
Income taxes	-2.6	-0.5
Net income (previous year: loss)	1.1	-4.6
of which DFS	1.9	-4.6
of which minority interest	-0.8	---

More information on segment reporting can be found in Note 34.

4 Personnel

Motivated and qualified staff are imperative for the long-term success of the DFS Group. This is why human resources management at DFS stresses a holistic approach from selection through attractive compensation and targeted training and development to the long-term retention of staff in the Group. Financial incentives are supported by HR policies aligned to the different phases of life and family needs.

Employee structure

As at 31 December 2019, the DFS Group had a total of 6,052 employees. This number is made up of non-exempt staff (covered by collective agreements), exempt employees (not covered by collective agreements) and executive staff as well as assigned personnel of the Federal Aviation Office (LBA) working for DFS and soldiers released from regular service. Non-exempt employees are subject to the provisions of the company-specific collective bargaining agreements.

Executive staff and exempt employees negotiate their contracts freely on an individual basis. These employees have target agreements covering corporate goals and their area of expertise. The degree of fulfilment of these agreements determines the variable salary components.

The assigned personnel of the Federal Aviation Office (LBA) working for DFS comprise another employee group. These established and non-established civil servants, who have remained in an employment relationship with the Federal Government, still fall under the Federal Civil Servants' Remuneration Regulation (*Bundesbesoldungsordnung*) and the collective agreement for the public service (*Tarifvertrag für den öffentlichen Dienst – TVöD*). The collective agreements at DFS do not apply to them. DFS bears the relevant expenses.

In general, air traffic controllers (from the age of 55) and flight data assistants (from 59) receive transitional payments in the period before their formal retirement. This right to receive transitional payments accounts for a significant component of the pension commitment (see Note 28).

Information on the compensation structure of the Board of Managing Directors can be found in Note 46.1.

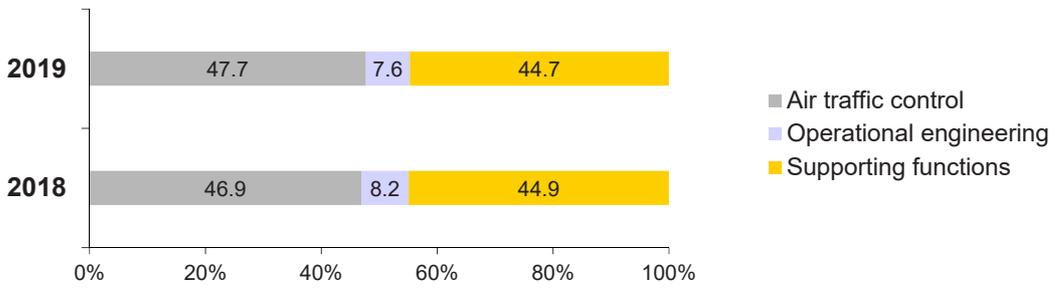
Employees (as at 31 December)					
	2019	2018	2017	2016	2015*
Permanent employees (total) (of which at subsidiaries)	6,052 (467)	5,750 (321)	5,608 (222)	5,695 (157)	5,742 (70)
Salaried staff (of which at subsidiaries)	5,475 (421)	5,249 (321)	5,156 (222)	5,210 (157)	5,214 (70)
Soldiers released from regular service	147	157	165	202	211
Wage-earners	18	20	22	22	25
Technical/commercial students & apprentices (of which at subsidiaries)	111 (11)	70 (4)	47 ---	41 ---	42 ---
Trainee air traffic controllers (of which at subsidiaries)	171 (35)	138 (20)	60 ---	48 ---	52 ---
Personnel belonging to the Federal Aviation Office (LBA)	130	140	158	172	198
of which established civil servants	(106)	(112)	(126)	(134)	(152)
of which non-established employees	(24)	(28)	(32)	(38)	(46)
Compared with previous year (%)	5.3	2.5	-1.5	-0.8	-2.3
Share of female employees (%)	27.3	27.5	27.5	27.1	27.0
Share of foreign employees (%)	4.0	4.5	5.2	4.7	3.9

* Figures adjusted

For 2019, the table contains 467 employees from the following subsidiaries:

- At the end of December, DFS Aviation Services had 140 members of staff.
- At the end of December, DAS Bahrain Co. W.L.L. had 76 members of staff.
- At the end of December, R. Eisenschmidt had 12 members of staff.
- At the end of December, Kaufbeuren ATM Training had 58 members of staff.
- At the end of December, Air Navigation Solutions had 171 members of staff.
- At the end of December, Droniq had 10 members of staff.
- DFS Energy and DFS International Business Services have no employees of their own.

Employees by area of duties (%)



Of the 6,052 employees of the Group, 960 were part-time – 626 women and 334 men. The share of part-time employees rose by 0.6 percent over the previous year, reaching

16.1 percent. The age structure of staff is well balanced, with the average age being 43 years. The turnover rate was 1.31 percent in 2019.

At present, 27.3 percent of employees are women. Currently, 67 of the 506 management positions in the company are held by women, representing a share of 13.2 percent.

DFS applies the German law on the equal participation of women and men in management positions in the private sector and in public service (FührposGleichberG) and has laid down a target for the share of female division directors of 5 percent (previously: 0%) and the share of female department heads of 13 percent (previously: 11%) for the periods from 1 January 2017 until 31 December 2021. The company is increasingly fostering in a targeted manner both family-friendly policies and equal opportunities.

Foreign employees mainly come from the United States of America and the United Kingdom, followed by Spain and Austria. Overall, 48 nations are represented.

Work and family

DFS is continuing to expand measures to support staff in combining work and family life and has set up HR policies aligned with the phases of life. It has been certified by the non-profit Hertie Foundation under its 'work and family audit' (*audit berufundfamilie*) since 2014. The second recertification is planned for 2020. Since 2011, DFS has been working with a childcare centre in Langen, where its Headquarters are located. Places are available for employees' children, and similar places are also available at childcare centres near the other DFS branches in Bremen, Munich and Karlsruhe. Since 2016, DFS has also offered a programme for school-aged children during the summer holidays at the company sites in Langen, Munich, Karlsruhe and Bremen. The support for employees who are caring for dependents was and continues to be expanded, for example by the HR and health management units at DFS providing comprehensive information and advice.

Over the course of their whole career, staff can make use of flexible working-time models, health programmes, a company sports club, seminars and further training opportunities.

Personal staff development

DFS is aware that a large part of the future success of the company is coupled to the further development of the individual strengths and abilities of its staff.

For this reason, DFS offers a wide range of initiatives to foster professional and interdisciplinary competences, which are continuously realigned with the changed needs of employees. The willingness to learn, the exchange of experience, networking and a feedback culture all play a central role in this regard.

Training

DFS is well aware of its responsibility to society and has been offering job-starters attractive trainee and university places with a career perspective for years.

Training starts		
	2019	2018
Total	198	179
Air traffic controllers (of which at subsidiaries)	142 (16)	135 (20)
Dual courses of studies / apprenticeships (of which at subsidiaries)	56 ---	44 (4)
Compared with previous year (%)	+10.61	+113.1

On 31 December 2019, a total of 330 people (including controllers doing on-the-job training – OJT) were undergoing multi-year air traffic controller training in the Group, 295 of whom (including OJT controllers) were at DFS. A total of 171 people were undergoing theoretical basic training.

In addition to the training of air traffic controllers, the portfolio of training offered at DFS also encompasses dual courses of studies in IT, air navigation technology, electrical engineering, air traffic management as well as IT-related and commercial apprenticeships. The portfolio of dual courses of studies is being supplemented by a degree course in air traffic management as a combination of a bachelor's degree in business with practical air traffic controller training.

This allows DFS to meet its demand for qualified staff. As these staff are trained internally, they will, in all likelihood, take on duties within DFS on completion of their training or degree.

Collective bargaining

The parties to the collective agreement, DFS and the air navigation services union (GdF), conducted negotiations on collective bargaining on the following topics in 2019:

On 19 February 2019, the parties to the collective agreement concluded the validation for workload-related compensation for the year 2018.

On 27 May 2019, DFS and GdF agreed on a comprehensive capacity increase and stabilisation pact which contains key points for reducing capacity bottlenecks in operations. The associated collective agreements were signed in July 2019.

On 25 June 2019, the GdF presented its demands on the issue of work and family. The parties to the collective bargaining agreement agreed on regulations concerning work and family. The associated agreement to amend the collective framework agreement was signed in the first quarter of 2020.

DFS and GdF held joint meetings on a quarterly basis within the framework of the so-called clearing office. This mechanism was set up in 2018 to discuss various individual issues associated with the collective agreements and resolve any uncertainties in the collective bargaining system.

The parties to the collective agreement saw a need to amend the collective agreement governing long-term time accounts (LZK-TV). These negotiations have now been completed. The joint signing took place in the first quarter of 2020.

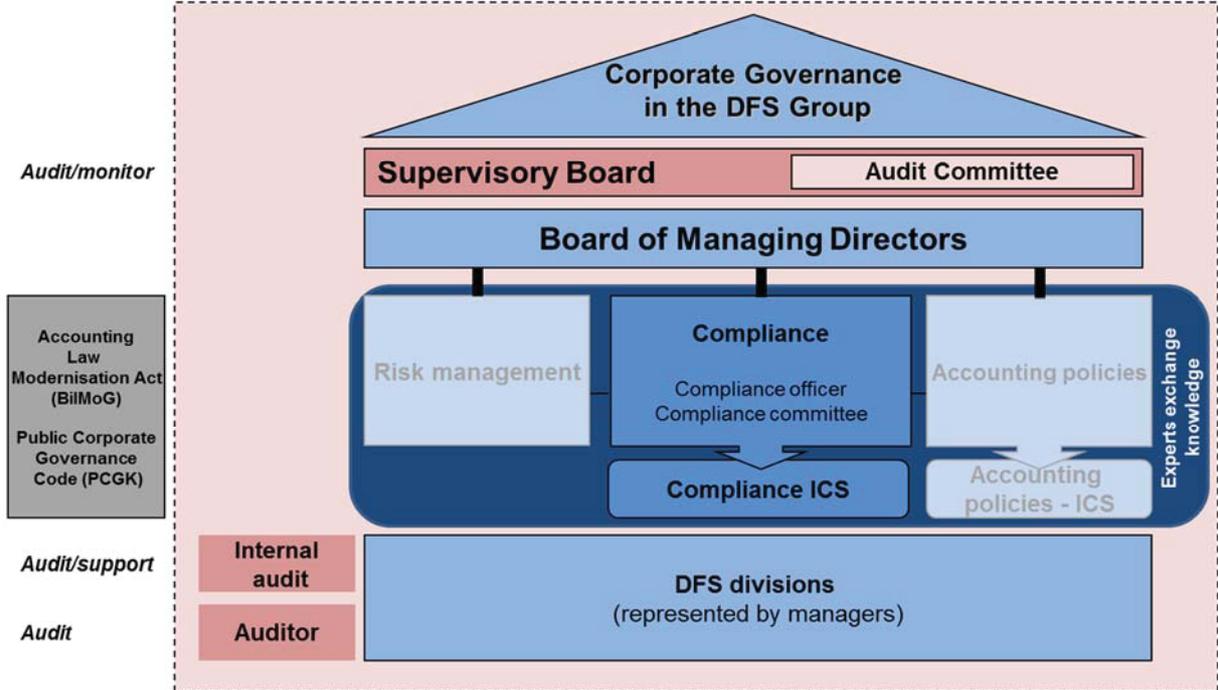
On 27 February 2019, the parties to the collective agreement signed the re-negotiated collective bargaining system for R. Eisenschmidt GmbH, which consists of a collective framework agreement, an agreement on the grading system and an agreement on occupational pensions.

The GdF terminated the collective agreement covering remuneration (VTV) no. 10, the agreement covering allowances (ZTV) no. 10 and the agreement covering remuneration for apprentices (VTV-A) no. 10 within the stipulated period as of 31 December 2019. The remuneration round was successfully concluded with a collective agreement for three years, starting from 1 January 2020. The collective agreements affected by this were signed in January 2020.

The GdF terminated the collective framework agreement (MTV) and collective agreement on the grading system (ETV) for Kaufbeuren ATM Training within the stipulated period as of 31 December 2019. The negotiations were successfully concluded on 17 December 2019 by signing the two collective agreements with a term of three years and a collective agreement covering a one-off payment 2019.

5 Compliance

Corporate Governance in the DFS Group



As a State-owned entity, DFS and the domestic subsidiaries where DFS is the majority shareholder are subject to the Public Corporate Governance Code (PCGK) of the Federal Government of Germany. Under this code, the Board of Managing Directors has to ensure adherence to and compliance with legal provisions and corporate guidelines. DFS introduced a compliance management system (CMS) on the basis of this code.

The CMS, together with the risk management system (RMS) and the internal control system (ICS) for accounting and financial reporting, form the three pillars of the corporate structure for risk management.

The compliance committee advises the compliance officer. The committee is made up of members of the first management level from the following divisions: Group Data Protection & Quality Management, Safety & Security Management, Controlling, HR Management Headquarters & Strategy as well as the head of Compliance and Risk Management.

To ensure the connection of the compliance management system to the internal control system, the directors of Financial Management and Group Internal Audit are permanent guests of the committee. In 2019, the compliance committee had four scheduled meetings.

DFS employees can also turn to an external ombudsman if they suspect a compliance infringement.

The emphasis of the activities in 2019 focused on compliance topics and the target orientation of the CMS, setting up tax compliance structures, publishing and announcing the new version of the DFS Code of Conduct and implementing a framework of compliance principles (Code of Conduct) for the majority holdings.

The compliance management system is constantly upgraded and expanded. Organisationally, the matter has been assigned to the Institutional and Legal Affairs division. There is a direct reporting channel from the compliance officer to the Board of Managing Directors and the Supervisory Board.

6 Risk report

6.1 Risk management system

The DFS Group uses a comprehensive set of instruments to identify, analyse, monitor and manage the risks associated with its business. The risk management process is managed centrally by the independent Compliance and Risk Management department. This department is supported by the risk management committee (RMC) when conducting evaluations that span several organisational divisions and processes. As a rule, the members of this body belong to the executive management level and are closely involved in the business decision-making processes, understand company-wide interrelationships and are hence in a position to contribute to forming a comprehensive overview.

The direct and indirect subsidiaries of DFS are systematically managed and monitored by means of in-house risk management systems using evaluation thresholds adapted to the respective company. The risk management systems of the material direct DFS investments (from a stake of 50%) are based on Group guidelines. These DFS investments inform the DFS Supervisory Board about the economic situation and the course of business (including risks) of the existing shareholdings within the scope of quarterly reporting in accordance with Section 90(1) of the German Stock Corporation Act (AktG) on managing shareholdings. Prior to this, consultations are held with the DFS Board of Managing Directors. This ensures communication up to Group management level.

Risk Management takes account of the changes taking place in the aviation industry and the Group, advances the risk management process methodically and therefore ensures the early identification of risks and the combatting of business risks.

This specialist department uses an operational instruction to lay down standards for the ongoing company-wide recognition, assessment, documentation and reporting of business risks. The early identification of risks begins with the applications for approval of business plans and projects. The following areas to be assessed with regard to potential effects comprise: operations (e.g. fulfilling the statutory mandate, infrastructure); finance (e.g. costs, financial markets, customers/suppliers); management (e.g. strategy, personnel, organisation) as well as the external environment (e.g. politics and legislation, disasters and terrorist attacks).

As part of their management duties, the directors of DFS divisions identify potential/existing risks, including for the issues mentioned above, and are responsible for ensuring that the statements on the risk situation in their organisational units are correct. They report quarterly unless an ad hoc report is required. A risk announcement contains a description and an assessment of the risk as well as the causes and countermeasures. In general, the forecast period is one year.

Risks are assessed across all segments and are based on an evaluation of the probability of occurrence and the possible level of damage of the hazards under consideration as reported by the organisational units concerned. The goal is a quantified assessment; in well-founded cases a qualified assessment is permissible. Criteria for a quantified assessment have been laid down centrally in an assessment matrix. Only the risks to the going-concern status are included in the risk report to the Board of Managing Directors and the Supervisory Board.

The reporting of risks to the Board of Managing Directors takes place on a quarterly basis, while the Supervisory Board is informed on a half-yearly basis. Both reports include an overview of changes to the prior period and all notifications that were no longer judged to be business risks in the period under review.

The integrity of the risk management system is regularly tested by Group Internal Audit as well as in the course of the audit of the annual financial statements by the external auditors.

6.2 Material risks

6.2.1 Corporate strategy risks

Corporate strategy risks arise primarily from misjudgements of external conditions and future market developments. They can lead to an inadequate alignment of corporate activities, with negative consequences for the results and financial position of the DFS Group. This is why DFS devotes special attention to the analysis and forecasting of air traffic, the political environment and the European charging and performance scheme. The Board of Managing Directors regularly reviews its estimates in close cooperation with all relevant bodies, checks variances and discusses risks. The DFS Board of Managing Directors therefore sees only a slight corporate strategy risk.

6.2.2 Financial risks

6.2.2.1 Principles of financial risk management

As part of its business activities, the DFS Group is exposed to numerous financial risks. The management of these risks is an integral component of the planning and implementation system. The Board of Managing Directors lays down the associated corporate policy. The objective of the corporate policy is to contain and/or mitigate existing risks. DFS Financial Management implements these targets and uses a system to manage financial risks that is tailored to the specific business of the Group. DFS continuously monitors and analyses the events on the financial markets in a critical dialogue with its core banks and the rating agency to reassess existing strategies or develop new strategies as necessary.

As part of its overall risk management system, DFS performs Value-at-Risk (VaR) analyses to manage market price risks (interest, currencies). The risk position is assessed by the Treasury unit based on market price risks. The VaR indicates the absolute loss for a company of a defined risk position which will not be exceeded with a previously defined probability over a given period of time. The calculation of the VaR at DFS is based on a holding period of ten days and a probability of 95 percent. On 31 December 2019, the cumulative loss at a confidence level of 95 percent amounted to under €2,078 thousand (previous year: €250 thousand).

The VaR is determined with the help of statistical time series on the relevant financial market data (interest rates, exchange rates). Historical simulations are computed by extrapolating scenarios from the past to the future using simulated changes in market values for financial instruments.

This market risk analysis includes all money market transactions of DFS, issued debenture loans, currency hedges as well as the associated risk positions (foreign currency purchases and foreign currency receivables/liabilities). Quantitative information on VaR values for risks from currency and interest rate changes is summarised in Note 38.3.

Clearly defined external conditions support the planning and control of risks based on the reporting. Speculative transactions with derivative instruments where there is no underlying transaction are forbidden. As regards financial investing, transactions are only entered into with counterparties who either have a long-term rating of at least A+/A1, short-term A-2/P-2, or a correspondingly high creditworthiness or other form of collateral.

6.2.2.2 Liquidity risk

Daily liquidity is monitored by the Treasury unit and is managed with liquidity planning during the year and over the medium term (see section 2.6.3.1).

6.2.2.3 Default risk

DFS is exposed to default risk and, increasingly, collection and enforcement risk from the operating business in the Control Centre and Tower divisions, from the commercial business as well as from financial instruments. That is why receivables are monitored constantly in the operating business and default risks considered by means of specific allowances. In addition, for terminal services DFS demands security deposits from customers with relevant sales volumes when defined warning thresholds are exceeded.

For the Control Centre division, EUROCONTROL invoices all flights on the basis of the data transmitted by the individual Member States and supplementary information from the Network Manager. The invoices are issued based on the data known at that point in time (operator, weight, distance). In individual cases, agreements are reached under which third parties make partial payments of outstanding amounts for services received after consultation with the Member States and at EUROCONTROL's reasonable discretion. EUROCONTROL does not require any security to be lodged but initiates enforcement measures to collect amounts due which have not been paid within the deadlines laid down. This requires a resolution from the Member States.

DFS has no influence on the discretion applied when EUROCONTROL makes such decisions. The intergovernmental agreement entitled Multilateral Agreement relating to Route Charges dated 12 February 1981 (BGBl. 1984 II p. 109) at European level prevents it from demanding security deposits to limit imminent defaults for en-route services. Notwithstanding these restrictions, the regulatory authority currently rejects the inclusion of these collection, default and enforcement risks as uncontrollable costs. The maximum default risk is reflected in the carrying amounts of the financial assets recognised on the balance sheet.

Warranty obligations for the commercial business are demanded as part of a contract-related quality management.

6.2.2.4 Rating risk

The business and performance of DFS are monitored by an external rating agency and the Deutsche Bundesbank (eligibility of the debt instruments of DFS). Negative analyses and the downgrading of the ratings could make the take-up of external financing more difficult and negatively influence the conditions for such financing and lead to higher interest rates.

DFS concluded a US lease-in/lease-out transaction (five tranches) with two US investors (QTE transaction) for a portion of its air navigation systems under non-current assets in 2002 and 2003.

This transaction was basically terminated in the second quarter of 2012. The remaining German shell structure with a remaining term up to the start of 2022 is restricted to a receivable to Nord/LB bank (the borrower) and a liability to KfW Bank (the lender). The associated cash flows match as regards amount, term and currency. Over its term, DFS bears the default risk of Nord/LB bank to the amount of €30.2 million as of the balance sheet date (previous year: €37.0 million).

KfW Bank is authorised to extraordinarily terminate the loan if the rating of DFS falls under AA- (Standard & Poor's) or Aa3 (Moody's). In such a case, DFS would have to name a third party within a period of thirty days that will acquire the receivable of KfW against DFS to the amount of €30.5 million (previous year: €37.5 million).

6.2.2.5 Interest rate risk

The Group is exposed to interest rate risk from financing, financial assets as well as from the measurement of obligations under occupational pensions.

The effective management of the interest rate risk is ensured through the use of derivative financial instruments with term and volume congruence between the underlying transaction and the hedge. DFS monitors the impact of regulations to be able to react with appropriate measures to changes in the area of occupational pensions.

Variances in the present value of the pension obligations for changes in parameters of +/- 0.5 percentage points are shown in the sensitivity analysis in the Notes (see Note 28.3).

6.2.2.6 Currency risk

The DFS Group is exposed to transaction risks as part of cross-border procurement transactions. The majority of foreign currency purchases/liabilities results from suppliers invoicing in US dollars (USD/\$). The total volume amounted to approximately \$1.7 million in the reporting period (previous year: \$2.0 million). Other currencies are only of minor importance.

These risks are limited by means of hedging using derivative financial instruments. Currency risks from financial transactions (foreign bonds, commercial paper) are hedged immediately on conclusion of the transaction.

A bullet euro loan of €3.5 million with a remaining term until 2023 made by DFS International Business Services to Air Navigation Solutions (UK) may lead to negative effects for Air Navigation Solutions from currency fluctuations.

A euro loan from DFS International Business Services to DAS Bahrain in the initial amount of €3.4 million as of 1 January 2019 may result in exchange rate losses for DAS Bahrain. As at 31 December 2019, the outstanding debt amounted to €2.4 million.

6.2.3 Performance-related and IT risks

The top priority for DFS and its subsidiaries is to ensure the safety of air traffic, which is why DFS has set up safety and security management systems for the provision of air traffic control services that correspond to the provisions of Regulation (EU) No 1035/2011. In addition, air navigation services are categorised as critical infrastructure under German law (*BSI-Kritisverordnung*) in accordance with Section 27c of the German Aviation Act (LuftVG). To meet the requirements of this law and to minimise the risks of cyber-attacks, DFS is working hard to establish a Security Operations Centre. The risk management system of DFS and its subsidiaries has incorporated ATM-related systems and applications as well as administrative systems and applications.

A variety of measures are taken at the level of planning, implementing and operating of the infrastructure of DFS and its subsidiaries to minimise the probability of downtime of the operational infrastructure, which would endanger the safety of air traffic and impact business performance. Where required for the provision of air navigation services, such measures include, for example, redundancy, diversification and the spatial separation and monitoring of critical systems, the extensive storage of data on external data carriers as well as the SAP backup computer centre.

6.2.4 Staff-related risks

The commitment and abilities of its staff are crucial for the DFS Group to maintain safety in German airspace and to ensure an efficient level of performance.

The environment for DFS has changed noticeably in the last few years through the introduction of economic regulation and increasing technological change. The Human Resources division is therefore called upon to support staff in exploiting the opportunities offered by change.

Against the background of the predicted decline in the labour force participation rate in Germany, demographic change and the increasing competition among companies for highly qualified staff and executives constitute a further risk that should not be underestimated. The internal demographic characteristics also present a risk as regards a balanced age structure and the long-term maintenance of professional skills.

Human Resources has set up a strategic HR and development programme as well as HR marketing and recruiting measures targeted at developing the workforce further and recruiting qualified professionals externally to meet needs.

DFS has a comprehensive in-house health management programme to ensure that staff remain healthy and maintain their ability to perform.

6.2.5 Insured risks

The insurance cover of DFS encompasses common insurable risks of DFS and its subsidiaries. It particularly includes compensation for the loss or damage of material assets and the resulting interruption of operations minus the usually agreed deductible.

It should be kept in mind when assessing the insured risks that DFS mainly performs sovereign functions on behalf of the Federal Republic of Germany in keeping with Article 87d of the German Basic Law (*Grundgesetz*) in conjunction with Sections 31b and 31d of the German Aviation Act (*LuftVG*). As a consequence, the Federal Republic of Germany is liable for claims brought by third parties for damages in line with the principles of State liability. In the case of damage culpably caused by DFS, aviation liability insurance covers a limit of €767 million per instance of damage, thus releasing the Federal Republic of Germany from its liability to this amount. For non-sovereign tasks, statutory public liability insurance is covered. For contractually agreed activities, such as the apron management service or the provision of air traffic services abroad through subsidiaries, the respective public liability agreed to the named amount in the contract is covered. In addition, claims for damages by third parties from employer's liability risks are covered by insurance.

6.3 Overall assessment of the risk situation

The Board of Managing Directors currently discerns no risks, except for abstract terror and catastrophe scenarios, which – occurring individually or as a group – would pose a threat to the going-concern status of the company.

7 Outlook

7.1 Development of the economic environment and the effects on air transport

At the beginning of 2020, leading economic institutes and organisations expected a slight recovery in the global economy for the years 2020 and 2021. The continuing expansive monetary policy of the major central banks, the partial settlement of the trade dispute between the United States of America and China, and diminishing concerns about an unregulated withdrawal of the UK from the EU are boosting global economic growth. The OECD, for example, forecasts global growth of around 3.0 percent in 2020 and 2021, while the World Bank expects 2.5 percent in 2020 and 2.6 percent in 2021.

In its 2019 autumn forecast, the European Commission expected gross domestic product (GDP) in the euro area to grow by 1.2 percent in both 2020 and 2021. The European Commission fears that the European economy could face a longer period of subdued growth and low inflation. Although labour markets remain robust and unemployment continues to fall, global economic conditions have been stimulating growth far less than in previous years.

For Germany, leading indicators observed at the end of 2019 point to growth, but with a degree of economic slowdown. At this moment in time, the forecasts of the economic organisations continued to assume that growth in Germany would be positive, although it was forecast across the board that growth would come in slightly below the previous year. The leading German institutes (including DIW, ifo, IfW) expect average growth of 1.1 percent in 2020 over the previous year, within a range of between 0.9 percent and 1.4 percent. In its Annual Economic Report 2020 published in January 2020, the Federal Government expects economic growth of 1.1 percent for 2020. Although economic momentum remained subdued at the beginning of 2020, the Federal Government believes that the economy should pick up slightly in the further course of the year. In the Autumn Projection 2019, the Federal Government still assumed a real GDP increase of 1.0 percent for 2020.

Regardless of the development in the external environment, the targets set in the performance plan for reference period 3 apply to DFS for the growth in service units. The base forecast of EUROCONTROL's Statistics and Forecast Service (STATFOR) shows a total of 15,367,000 service units for en-route services for 2020 (+1.6 percent year-on-year). An increase of 12 percent is expected for the period from 2020 to 2025. STATFOR expects 1,484,600 service units for terminal services in 2020 (minus 0.5 percent year-on-year). For the period from 2020 to 2025, STATFOR forecasts an increase of 6 percent.

At the end of February 2020, the International Air Transport Association (IATA) assumed that fewer people would fly in 2020 than in the previous year. Experts expect that demand for tickets at airlines in the Asia-Pacific region to be around 13 percent lower than anticipated due to the coronavirus. Since airlines from other regions will also be affected, IATA expects worldwide passenger volumes to be 0.6 percent lower than in the previous year. As recently as December, IATA had predicted worldwide growth in passenger numbers of 4.1 percent for 2020.

Given the rapid spread of the coronavirus, the World Health Organisation (WHO) feared a possible pandemic as at the end of February 2020. With no definitive assessment of the effects possible, it is doubtful whether the forecasts for general economic growth and, especially for air transport, can be accurate in this environment.

It is difficult to assess the ongoing effects and development in connection with the spread of COVID-19 and, therefore, it is not possible at present to reliably estimate the expected negative impact on the business of DFS. Business activities are made more difficult by the fact that the infrastructure must be provided regardless of demand, while also maintaining a high level of safety and service quality. However, the Board of Managing Directors is constantly monitoring the situation very closely and actively assessing the impact on the business activities of DFS.

7.2 Future development

7.2.1 Regulated business

Preparation for reference period 3 (2020–2024)

The third reference period begins in 2020 on the basis of the Regulation on a common charging scheme (Regulation (EU) No 2019/317) and the EU targets under Commission Implementing Regulation (EU) No 2019/903. On the one hand, the new regulation entails strengthening the role of the national supervisory authority and takes account of local particularities. From 2020, en-route charges will be calculated based on the route actually flown. On the other hand, it contains a further significant increase in the complexity of the requirements and the associated administrative processes. Nevertheless, major changes such as the shortening of the regulatory period demanded by some, the fundamental role of EU institutions or market-oriented regulation can only be addressed within the framework of a future SES III framework regulation.

The FABEC Member States have again opted to establish the performance plan at FABEC level. The performance plan was submitted by the Member States to the European Commission for evaluation in due time on 1 October 2019, revised following an analysis of completeness and resubmitted at the end of November.

The German contribution to the key area of cost-efficiency includes the result of what is known as the national solution (or negotiated solution) between airspace users and DFS. Within the framework of this solution, cost-increasing effects (such as the build-up of air traffic control capacity) were taken into account.

The European Commission plans to complete the analysis of the performance plans by the end of the first quarter of 2020.

European Aviation Safety Agency (EASA)

The revision of the EASA Basic Regulation was published in the Official Journal of the EU as Regulation (EU) No 2018/1139 on 22 August and entered into force on 11 September 2018. This Regulation significantly expanded the competence of EASA as the agency for aviation safety, for example in the areas of the environment, research and international cooperation. In the coming years, EASA will step up the development of requirements for the handling of unmanned aircraft systems as well as the technical interoperability and standardisation of air traffic control technology and submit them to the European Commission for determination within the framework of implementing regulations.

Further development of the SES framework regulations

In 2020, the European Commission is expected to draw up a new proposal for the further design of the future Single European Sky and, on the basis of the proposals for an SES II+ already discussed in 2014, to submit it to both the Member States and the European Parliament for further consultation. The Federal Republic of Germany will hold the Presidency of the European Council in the second half of 2020 and will be able to play a leading role in the further development of the Single European Sky in this context.

iCAS programme

The previous plan for the development and introduction of iCAS at the control centres for lower airspace has been adapted. The cutover time windows for the introduction of iCAS at the units for lower airspace will be shifted by one year to 2021/2022 for the Munich branch, 2022/2023 for the Bremen branch and 2023/2024 for the Langen branch, making use of the one-year risk buffer already provided for.

The deadline for the introduction of Flight Object Interoperability (FO IOP) was taken out of Commission Implementing Regulation (EU) No 716/2014. DFS intends to continue the iCAS Flight Object IOP project for both strategic and cooperative reasons.

The local project iCAS Phase II in KAR was initiated to standardise the ATS system used at control centres. This project aims to replace the iCAS Phase I software at the Karlsruhe control centre, which was successfully put into operation in 2017, with the iCAS Phase II software, which will then be used at all other control centres. This project is being implemented outside the programme.

Remote tower control

From the first quarter of 2021, Erfurt Airport is planned to be the next airport to be controlled remotely. After another validation phase during which the RTC concept will be reviewed again, Dresden Airport is scheduled to follow at the end of 2022.

In addition, it is intended to provide more airports with remote tower services in a future project.

At the European level, research is currently being carried out as part of SESAR 2020 on air traffic controllers handling several smaller airports at the same time and not just one. DFS is involved in these research projects to incorporate verified and validated results at an early stage into its own projects if the results are positive.

SESAR Deployment Manager

DFS aims to exert material influence on the SES initiative of the European Commission as part of its strategic orientation. To this end, DFS has been an active member of the SESAR Joint Undertaking (SJU) since June 2009, along with other leading organisations. Together with its partners, DFS is developing technologies and procedures that are fit for purpose (see section 1.6) and thus meet the European requirements for the modernisation of the air traffic management network.

Since 2014, the SESAR development process has led to the long-term phase of technical and operational implementation and the setting up of ATM procedures (deployment management). As part of the SESAR Deployment Alliance, DFS has been fulfilling the task awarded by the Commission in 2014 to plan, coordinate and implement a comprehensive modernisation of European airspace within the scope of deployment management for the time period since 2014. This consortium is a cross-industry partnership of five airlines, twelve air navigation service providers and 25 airport operators. The task is financed out of the

Connecting Europe Facility (CEF) programme, where a total of roughly €2.5 billion is earmarked until the end of 2023 for deployment management. DFS is thus able to influence the introduction of new technologies and procedures and the company benefits from the considerable funding, as well as from the avoidance of incorrect cost allocation and flawed capital expenditures.

Project S-ATM Robusto (sectorless air traffic control in upper airspace)

The objective of the S-ATM Robusto project is the implementation of the first step in sectorless air traffic control at the Karlsruhe control centre. With the implementation of the sectorless air traffic management (S-ATM) concept, DFS expects to be able to deploy personnel in S-ATM airspace more flexibly, avoid overload situations, respond better to traffic fluctuations and generally operate more economically. This concept means that specific parts of airspace are no longer divided into sectors or sector families but viewed as a whole. Each air traffic controller is assigned a defined number of aircraft in this considerably larger airspace. These aircraft could be anywhere in their area of responsibility. By establishing a sectorless airspace, aircraft no longer need to be transferred to another air traffic controller at sector boundaries. Instead, they are handled by the same air traffic controller while flying in this airspace.

The previously announced plan for the commissioning of the first intermediate step (here: S-ATM Robusto 1 – four sectors of sector family EAST above approx. FL 385) has been revised and the start-up is being postponed by one year to the new cutover time window Q4 2021 / Q1 2022. With regard to the next step (S-ATM-Robusto 2 – entire UIR Karlsruhe above approx. FL 375), further investigations, including simulations to identify and stabilise operational and technical requirements, are pending. In 2020, external communication on the lessons learnt so far and the results achieved, including an outlook on the next steps, is planned.

Withdrawal of the United Kingdom from the EU

On 31 January 2020, the United Kingdom left the EU. Transitional arrangements currently apply. Air traffic is not expected to be interrupted. The airlines affected have also taken countermeasures, such as founding EU subsidiaries, transferring aircraft, changing the ownership structure and taking similar initiatives.

Capacity initiative

DFS continues to pursue the measures already passed to improve capacity (see section 2.2) to be able to continuously provide the capacity demanded in airspace against a background of rising traffic volumes. Safety remains the number one priority.

An important focus is boosting the pipeline of new air traffic controllers; relieving the pressure on upper airspace; working with the party to the collective agreements on boosting staff flexibility; recruiting fully trained air traffic controllers (known as ready entries) as well as investing in new technologies and projects of strategic importance.

Sufficient financial resources are required to be able to implement these initiatives, even in times of economic regulation. The targets for the third reference period are currently being negotiated.

Air navigation services at selected German regional airports

The Federal Ministry of Transport and Digital Infrastructure (BMVI) plans to ease the financial burden on small airports in Germany. The Ministry is examining the possibility of setting up a separate charging system for regional airports, as air traffic control charges will then be levied directly on airlines without the involvement of the airport operator. This does not affect the charging system for the 16 designated international airports, where DFS is responsible for aerodrome control. The consequences for DFS Aviation Services, which operates at German regional airports, will have to be examined in the course of the further legislative procedure.

Method to calculate service units

Commission Implementing Regulation (EU) No 2019/317 dated 11 February 2019 specifies the determination of both the weight factor and the distance factor from 1 January 2020. From 2020 onwards, only the certificated maximum take-off weight of an aircraft entered in the aircraft flight manual will be relevant for determining weight. The distance factor will still be calculated based on the great circle distance between the entry and exit point of a Flight Information Region (FIR). Whereas in the past the flight plan was decisive for determining the entry and exit points, in the future the actual entry and exit points will be taken.

The change in the calculation method is neutral for the calculation of the charges. On the one hand, Germany will probably record slightly more service units than under the previous calculation method (*ceteris paribus*). However, since these were already taken into account in the performance plan for reference period 3, no effect on revenues from the change in the Regulation is expected.

7.2.2 Commercial business

The management of the Group plans a further expansion of the commercial business in the strategic business areas

- Aeronautical data, engineering & systems
- Air traffic services & apron
- Consultancy
- Aviation training services
- UTM services & systems, including UAS training services

when opportunities arise on the market. Marketing and consulting activities are being expanded worldwide. This expansion is being supported by maintaining representative offices close to customers in the particularly promising markets of Southeast Asia and China.

For 2020, the management of the Group expects a further expansion of activities in the Gulf region, among others, and market entry into Spain. Droniq will generate planned losses for its expansion and growth strategy and the development of its products.

For this reason, the Board of Managing Directors forecasts negative earnings in the low double-digit million euro range in the commercial business of the DFS Group in 2020.

The support of commercial business by DFS provides relief for the regulated business and thus for airspace users.

7.3 Results and financial position

7.3.1 Revenues and costs

A decline in traffic volume has already been observed since the 2019/2020 winter flight schedule (from November 2019). Due to the effects of the spread of the coronavirus, a further decline in traffic is to be feared. Whether, and when, the volume of traffic will return to the level of 2019 cannot be predicted. It is probable that the decrease in traffic will also lead to declining revenues from charges.

Expenses in both the regulated business and the commercial business are primarily influenced by staff costs, including the cost of occupational pensions. Staff costs will continue to rise considerably due to the rise in recruitment of air traffic control staff and the increase in costs for occupational pensions because of the continued decline in the discount rate.

As the revenues from charges are determined by economic regulation, revenues from air navigation charges or sales revenues will not cover total costs. That is why DFS will face considerable financial challenges in 2020 and in the following years of the third reference period.

The Board of Managing Directors is counteracting these challenges with personnel policy measures (see section 4 on the capacity increase and stabilisation pact) and the Sprint2024 programme, among other things. It focuses on boosting productivity and responding to dynamic demand with increased staff flexibility and a targeted rise in staff recruitment. Airspace structures and procedures are being optimised and capital expenditure on recoverable, high-performance and harmonised ATM systems is being stepped up. Project and general costs are to be reduced in this manner.

The Board of Managing Directors sees the potential for negative consequences for earnings from the incentive system (capacity) that has been introduced. Due to the current splitting of traffic risk and cost risk, air navigation service providers are being burdened with the consequences stemming from changes in certain factors over which they have no control, such as shifts in traffic streams, deviations from traffic forecasts, weather conditions or strikes by air traffic services personnel in neighbouring countries.

7.3.2 Capital expenditure

Capital expenditure on air traffic control systems to expand capacity and on infrastructure, as well as on replacement investments, will be financed from cash flow or loans and amortised by matched depreciation/amortisation charges.

Overall, the level of depreciation and amortisation in 2020 is scheduled to come in at the level of 2019.

7.3.3 Liquidity

The financial strategy of DFS is primarily influenced by two counteracting effects from events on the capital markets. Low interest rates on the capital markets are favouring the take-up of debt and ensuring low interest expenses. At the same time, the returns that can be earned on the market make it difficult to earn substantial low-risk income. In this environment, DFS is currently paying penalty interest rates of 50–80 basis points on its demand deposits. The development of earnings and the maturity of two debenture loans in the coming reference period will have a material effect on liquidity.

7.3.4 General statement and earnings forecast

Economic and industry-specific influences can have a significant impact on the operational and financial development of the DFS Group.

The first few months of the business year 2020 have been marked by the effects of the spread of the coronavirus. The number of cases is increasing daily, not only in Germany. On 30 January 2020, the World Health Organisation (WHO) declared an international health emergency due to the outbreak of the coronavirus. Since 11 March, the WHO has now classified the spread of the coronavirus as a pandemic.

DFS formed a Coronavirus Team in February. The primary objective is to protect DFS employees against infection with the coronavirus and to maintain the services in operational and technical domains. Additional hygiene measures, travel restrictions and cancellations of trade fair participation have been put in place to achieve this objective.

The spread of the virus is also affecting the economy and the capital markets. The current great uncertainty regarding the global spread and consequences of the coronavirus makes it difficult to accurately forecast the business development of the DFS Group for the year 2020. Due to the outbreak of coronavirus at the end of February 2020, the International Air Transport Association (IATA) has revised its original forecast of four-percent growth in passenger traffic and expects airlines worldwide to lose \$63 billion in revenue (-11%). In a worst-case scenario, which assumes a more extensive spread of the coronavirus, IATA expects a drop in revenues of \$113 billion (-19%). In this scenario, the ten most important Western European markets, including Germany, are expected to see a decline of 24 percent in passenger numbers and a corresponding decline in revenues of \$37 billion.

In the overall view for 2020, DFS assumes, based on the latest developments, that the negative effects due to the spread of the coronavirus and the necessary containment measures will be felt throughout the year. Since many companies have also imposed travel and cost restrictions on their employees, air traffic in and over Germany and the project business worldwide will be particularly affected. Individual countries, such as the United States of America, have imposed entry restrictions on travellers from Germany. The effects on the demand for air travel and the services provided by DFS Aviation Services are therefore considerable. Although massive monetary and fiscal policy measures are being introduced in many countries as a result, these will not immediately stabilise air traffic for the long term.

The Board of Managing Directors assumes that the consequences of the crisis will affect the economic development of the Group in 2020 in all segments and regions. The duration of the adverse effects cannot be estimated at present, as they depend to a large extent on the course of the crisis. Possible further longer-term effects as a result of the spread of the coronavirus and the associated volatility of the financial markets cannot be assessed at present and are therefore not included in the outlook.

According to current estimates, the Board of Managing Directors expects a considerable decline in traffic, which, under the current regulatory regime, will lead to a drop in revenues from charges and a corresponding reduction in liquidity. Revenues from the commercial business are also expected to decrease.

Staff costs, the largest component of total costs, will increase, among other things due to the collective bargaining agreement and the continued training of air traffic controllers (trainees).

DFS intends to counteract the decline in revenues with a rigorous cost-cutting programme. However, this will be difficult to implement in the short term due to the high proportion of fixed costs. The cost savings will only marginally compensate for the negative effects in 2020. The exact extent of the decline depends primarily on the further spread of the virus and the capacity adjustments made by the airlines when passenger traffic resumes.

The financial result depends strongly on the development of the stock and bond markets due to the large-scale reinsurance of company pension and transitional payments. This development is very difficult to predict, not only because of the spread of the coronavirus. Should the development continue as it has now become evident, a clearly negative financial result must be expected.

The Board of Managing Directors expects a negative result in the mid three-digit million euro range for 2020.

The Group currently has liquid funds of approximately €195 million. The Board of Managing Directors of DFS is in direct contact with the Federal Government and its Shareholder regarding the announced government aid, which is also available for the aviation industry. It expects thanks to these measures a short-term improvement in the financial situation following the significant reduction in liquidity resulting from the decline in revenue from charges. The Board of Managing Directors will continuously evaluate the situation and is examining a large number of measures. Further fundraising is currently in progress.

Langen, 13 March 2020

The Board of Managing Directors

Prof Klaus-Dieter Scheurle
Chairman and
Chief Executive Officer

Dirk Mahns
Chief Operating Officer
Managing Director

Friedrich-Wilhelm Menge
Chief Technology Officer
Managing Director

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DFS Deutsche Flugsicherung GmbH

Consolidated statement of comprehensive income for the period 1 January 2019 to 31 December 2019

	Note	2019 €'000	2018 €'000
Continuing operations			
Revenues	5	1,109,717	1,107,053
Changes in inventory and other own work capitalised	6	18,588	17,448
Other operating revenues	7	52,752	53,419
Total operating revenues and income		1,181,057	1,177,920
Material expenses	8	-10,933	-12,492
Employee expenses	9	-935,227	-878,863
Other operating expenses	12	-156,881	-145,018
Earnings before interest, taxes, depreciation and amortisation (EBITDA)		78,016	141,547
Depreciation and amortisation	10	-104,137	-117,226
Impairment losses on financial assets and contract assets	11	-4,811	-934
Earnings before interest and taxes (EBIT)		-30,932	23,387
Financial income	13	215,471	119,649
Financial expenses	13	-150,109	-173,708
Financial result	13	65,362	-54,059
Profit (loss) before income taxes		34,430	-30,672
Income taxes	14	357	577
Earnings for the period (continuing operations)		34,787	-30,095
Allocation of the earnings of the period			
Shareholder of the parent company		35,635	-30,095
Earnings attributable to minority interests		-848	0

	Note	2019 €'000	2018 €'000
Earnings for the period (continuing operations)		34,787	-30,095
Other comprehensive income			
Items not reclassified in profit or loss			
Remeasurement of the net defined benefit liability from the defined benefit obligation = actuarial gains (+) and losses (-) of the ongoing business year	27	-793,522	-171,042
Tax effects		0	0
Items that can be reclassified in profit or loss			
Changes in the fair value of debt instruments at fair value through other comprehensive income	27	0	-15,284
Currency differences from the conversion of foreign operations or investments	27	95	7,362
Tax effects		0	0
Other comprehensive income for the period		-793,427	-178,964
Total results for the period		-758,640	-209,059
Allocation of the total result			
Shareholder of the parent company		-757,792	-209,059
Income and expenses attributable to minority interests		-848	0

DFS Deutsche Flugsicherung GmbH

Consolidated balance sheet as at 31 December 2019

	Note	2019 €'000	2018 €'000
Assets			
Goodwill	15	80	80
Intangible assets	16	206,299	191,682
Property, plant and equipment	17	499,314	499,858
Investment property	19	662	692
Financial assets accounted for using the equity method	20	14,438	14,359
Financial assets	20	9,998	10,586
Trade receivables	21	51	0
Other receivables and assets	23	76,570	75,292
Deferred tax assets	14	15,814	13,639
Non-current assets		823,226	806,188
Trade receivables	21	152,194	157,741
Contract assets	22	2,431	7,146
Other receivables and assets	23	32,721	23,134
Inventories	24	6,196	5,267
Financial assets	25	758,948	677,166
Liquid funds	26	366,598	455,089
Tax assets	33	79,827	26,135
Current assets		1,398,915	1,351,678
Total		2,222,141	2,157,866

	Note	2019 €'000	2018 €'000
Equity and liabilities			
Subscribed capital	27	755,288	755,288
Capital reserve	27	74,296	74,296
Remeasurement reserves	27	-2,345,964	-1,552,537
Retained earnings	27	93,081	57,446
Share of equity attributable to Shareholder of parent company	27	-1,423,299	-665,507
Minority interest	27	4,052	0
Equity	27	-1,419,247	-665,507
Provisions for pensions and similar obligations	28	2,751,756	2,016,601
Other provisions	29	217,182	208,640
Financial liabilities	30	152,776	226,723
Trade payables	31	332	570
Other liabilities	32	25,689	19,135
Income tax obligations	33	30,869	30,869
Non-current liabilities		3,178,604	2,502,538
Other provisions	29	234,714	183,219
Financial liabilities	30	98,537	9,927
Trade payables	31	25,701	30,238
Contract liabilities	22	2,321	1,408
Other liabilities	32	101,411	95,943
Income tax obligations	33	100	100
Current liabilities		462,784	320,835
Total		2,222,141	2,157,866

DFS Deutsche Flugsicherung GmbH

Consolidated statement of changes in equity

for the period 1 January 2019 to 31 December 2019

Note 27	Subscribed capital	Capital reserves	Revaluation reserves	Retained earnings	Equity attributable to Shareholder of parent company	Minority interest	Total
	€'000	€'000	€'000	€'000	€'000	€'000	€'000
As at 31 Dec 2017	530,288	74,296	-1,373,573	87,685	-681,304	0	-681,304
Adjustments from the initial application of IFRS 15	0	0	0	-144	-144	0	-144
Adjusted as at 1 Jan 2018	530,288	74,296	-1,373,573	87,541	-681,448	0	-681,448
Capital increase	225,000	0	0	0	225,000	0	225,000
Operating result							
Net loss (-)	0	0	0	-30,095	-30,095	0	-30,095
Other comprehensive income							
Remeasurement of the net defined benefit liability	0	0	-171,042	0	-171,042	0	-171,042
Changes in the fair value of debt instruments at fair value through other comprehensive income	0	0	-15,284	0	-15,284	0	-15,284
Currency differences from the conversion of foreign operations or investments	0	0	7,362	0	7,362	0	7,362
Tax effects	0	0	0	0	0	0	0
As at 31 Dec 2018	755,288	74,296	-1,552,537	57,446	-665,507	0	-665,507
Capital increase	0	0	0	0	0	4,900	4,900
Operating result							
Net income (+) / loss (-)	0	0	0	35,635	35,635	-848	34,787
Other comprehensive income							
Remeasurement of the net defined benefit liability	0	0	-793,522	0	-793,522	0	-793,522
Currency differences from the conversion of foreign operations or investments	0	0	95	0	95	0	95
Tax effects	0	0	0	0	0	0	0
As at 31 Dec 2019	755,288	74,296	-2,345,964	93,081	-1,423,299	4,052	-1,419,247

DFS Deutsche Flugsicherung GmbH

Consolidated cash flow statement

for the period 1 January 2019 to 31 December 2019

	2019	2018
	€'000	€'000
Net income (+) / loss (-)	35,635	-30,095
of which dividend received	551	721
of which current income taxes	0	76
of which actual income taxes paid (-)	-54,913	-18,773
Interest	-8,539	-766
Depreciation and amortisation on intangible assets and property plant and equipment	104,137	117,227
Income (-) from asset disposals	-756	-82
Losses (+) from asset disposals	1,094	994
Other non-cash changes from the revaluation reserves	-793,408	-179,112
Decrease (+) / increase (-) in trade receivables	5,496	-1,945
Decrease (+) / increase (-) in contract assets	4,715	-960
Increase (-) in other receivables and assets	-17,497	-4,442
Increase (-) / decrease (+) in inventories	-929	37
Increase (-) in current tax assets	-53,692	-19,047
Increase (-) in deferred tax assets	-2,175	-653
Increase (+) / decrease (-) in provisions for pensions and similar obligations	735,156	-167,194
Increase (+) in other provisions	60,037	89,787
Decrease (-) in trade payables	-4,775	-6,573
Increase (+) / decrease (-) in contract liabilities	913	-1,563
Increase (+) in other liabilities	12,021	6,261
Decrease (-) of the QTE transaction	-194	-200
Cash outflow/inflow from operating activities	77,239	-198,326
Payments (-) for investments in intangible assets and property, plant and equipment	-120,373	-96,961
Payments (-) for investments in financial assets	-79	-18,570
Proceeds (+) from disposal of intangible assets and property, plant and equipment	1,836	1,811
Proceeds (+) from disposals of financial assets	587	2,813
Cash outflow from investing activities	-118,029	-110,907
Amounts paid in (+) by Shareholder	0	225,000
Equity transaction by minority interests	4,052	0
Taking on (+) financial debt	0	361
Principal payment (-) on financial debt	-1,563	-25,000
Taking on (+) lease liabilities	25,530	0
Paying off (-) lease liabilities	-2,645	0
Interest expenses (+) for lease liabilities	168	0
Interest received (+)	14,464	8,341
Interest paid (-)	-5,925	-7,575
Cash inflow from financing activities	34,081	201,127
Net change in cash and cash equivalents	-6,709	-108,106
Cash and cash equivalents as at 1 Jan	1,132,255	1,240,361
Cash and cash equivalents as at 31 Dec	1,125,546	1,132,255

Notes to the consolidated financial statements 2019

1 General basis

The DFS Group is an air navigation service provider (ANSP) that operates internationally. The ultimate parent company is DFS Deutsche Flugsicherung GmbH (DFS), which has its Headquarters in 63225 Langen, Am DFS-Campus 10, Germany. The company is registered on the Commercial Register (HRB 34977) at the Local Court in Offenbach am Main, Germany, as a limited liability company (GmbH). DFS is wholly owned by the Federal Republic of Germany, represented by the Federal Ministry of Transport and Digital Infrastructure (BMVI).

The main business of the DFS Group is defined by the tasks set out in Section 27c of the German Aviation Act (LuftVG). Under this act, it is entrusted with providing air traffic services (a sovereign task). The Group management report contains information on the business activities and the object of the Group (see sections 1.2 and 1.3 in the Group management report).

2 Application of accounting standards

The regulations:

Regulation (EC) No 1606/2002 of the European Parliament and of the Council of 19 July 2002 on the application of international accounting standards

Regulation (EC) No 550/2004 of the European Parliament and of the Council of 10 March 2004 on the provision of air navigation services in the Single European Sky (the service provision Regulation)

Regulation (EC) No 1794/2006 of the Commission of 6 December 2006 laying down a common charging scheme for air navigation services

Regulation (EU) No 1191/2010 of 16 December 2010 amending Regulation (EU) No 1794/2006 of the Commission on the development of a common charging scheme for air navigation services

Regulation (EU) No 390/2013 of the Commission of 3 May 2013 laying down a performance scheme for air navigation services and network functions

Regulation (EU) No 391/2013 of the Commission of 3 May 2013 laying down a common charging scheme for air navigation services

oblige the DFS Group to draw up its consolidated financial statements as at 31 December 2019 in line with International Financial Reporting Standards (IFRS). It applies the standards of the International Accounting Standards Board (IASB) and the interpretations of the International Financial Reporting Interpretations Committee (IFRIC) as recognised and endorsed by the European Union (EU).

These financial statements consider Regulation (EC) No 1606/2002, which is enacted in Section 315e of the German Commercial Code (HGB) by means of the Accounting Law Reform Act (BilReG) dated 4 December 2004.

These consolidated financial statements were prepared in accordance with the standards endorsed for use in the EU.

The business year of the Group corresponds to the calendar year (1 January to 31 December).

The Board of Managing Directors of DFS drew up the consolidated financial statements and approved them for submission to the Audit Committee of the Supervisory Board and the Supervisory Board on 5 March 2020. The Supervisory Board discussed the consolidated financial statements and the opinion of the Audit Committee and issued a recommendation to the Shareholder to approve the consolidated financial statements. The Shareholder may amend the consolidated financial statements released by the Board of Managing Directors. The approved consolidated financial statements will be available via the electronic German Federal Gazette in accordance with Section 325(2a)(1) of the German Commercial Code (HGB) and on our website at www.dfs.de.

3 Consolidation

3.1 Consolidation principles

On initial consolidation of Group companies, the DFS Group measures the acquired identifiable assets, liabilities, contingent liabilities and deferred taxes at fair value at the acquisition date for business combinations (acquisition method) and compares these to the acquisition costs (purchase price allocation). The non-acquired share of the fair values of assets and liabilities is accounted for as minority interest by the Group. Acquisition-related costs are expensed in the periods in which the costs are incurred.

After the purchase price allocation, the Group recognises the remaining difference between the purchase price and the newly measured proportionate net assets as goodwill. If the value of the net assets acquired exceeds the purchase price, the difference is recognised directly in profit or loss. The DFS Group recognises the differences from acquired minority interests directly in equity after the transfer of control. The acquisition costs of foreign entities acquired are translated into euro at the respective exchange rate at the date of acquisition.

The DFS Group eliminates the revenues, income and expenses as well as the receivables and liabilities stemming from transactions between the consolidated entities against each other. In addition, it eliminates the interim results from intercompany deliveries of non-current assets and inventories.

3.2 Scope of consolidation

DFS, as the ultimate parent company, presents the consolidated financial statements including all those investments where it holds a controlling interest, joint arrangements, associated companies and those investments where it holds a non-controlling interest.

The Group includes investments where it holds a controlling interest if it has existing rights that give it the current ability to direct the relevant activities of an investee. Relevant activities are activities that significantly affect the investee's returns. Within the meaning of IFRS 10, the DFS Group controls a subsidiary when it has exposure, or rights, to variable returns from its involvement with the investee and has the ability to use its power over the investee to affect the amount of these returns due to the ability to direct the relevant activities. In the absence of any other restrictive contractual arrangements, control is generally based on the direct or indirect majority of voting rights of the Group. For structured entities, control is based on contractual arrangements and not on the majority of voting rights. Subsidiaries have to be consolidated from the time that control passes to the Group. They are deconsolidated when control is no longer exercised. Non-controlling interests in earnings and equity of investments with a controlling interest are disclosed separately in the consolidated statement of comprehensive income, the consolidated balance sheet and the consolidated statement of changes in equity.

IFRS 11 differentiates as regards stakes in joint arrangements between joint ventures and joint operations. The classification depends on the contractual rights and obligations of each investor. Joint arrangements exist when the DFS Group jointly controls activities with a third-party based on a contract. For joint operations, the Group recognises its direct rights to assets, liabilities, revenues and expenses as well as its share of any assets, liabilities, revenues and expenses held or incurred jointly. Stakes in joint operations are accounted for using the equity method (see Note 4.3.4).

The DFS Group measures associated companies over which it exercises significant influence, but has no control or joint control, using the equity method. Significant influence is indicated when the DFS Group directly or indirectly holds between 20.00 percent and 50.00 percent of the voting rights in an investee. The assumption of influence can be reversed through a clear demonstration to the contrary. The annual measurement is carried out by raising or lowering the carrying amount of the investment to reflect the investor's share of the net assets.

Taken together, the investments where there is a non-controlling interest exert only an immaterial influence on total assets, revenues and net income from a Group perspective and are not material for the representation of the results and financial position of the DFS Group. A materiality threshold of 5.00 percent was set out for this. The Group does not include them in the consolidated financial statements. These entities are recognised at their fair value or, if this cannot be reliably determined for equity instruments that are not listed, at amortised cost. They are disclosed as investments under non-current financial assets.

Changes in scope of consolidation					
	As at 31 Dec 2018	Consolidation/ reconciliation	Additions	Disposals	As at 31 Dec 2019
Consolidated companies (controlling interest)	8	0	1	0	9
of which domestic	6	0	1	0	7
of which foreign	2	0	0	0	2
Associated companies – measurement using equity method	3	0	0	0	3
of which domestic	1	0	0	0	1
of which foreign	2	0	0	0	2
Investments (non-controlling) – measurement using cost method	4	0	0	0	4
of which domestic	1	0	0	0	1
of which foreign	3	0	0	0	3

Companies included in the consolidated financial statements of the DFS Group

List of shareholdings under Section 313(2)(4) German Commercial Code (HGB)

Acronym	Company	Registered office	Percentage of shareholding	Equity	Net income/loss
			in %	€'000	€'000
DFS	DFS Deutsche Flugsicherung GmbH	Langen, Germany	Ultimate parent company		
Consolidated companies (controlling interest)					
DFS IBS	DFS International Business Services GmbH	Langen, Germany	100.00	53,494	6,487
DFS Energy	DFS Energy GmbH	Langen, Germany	100.00	5,132	0 ¹⁾
DAS	DFS Aviation Services GmbH	Langen, Germany	100.00	11,794	0 ²⁾
Eisenschmidt	R. Eisenschmidt GmbH	Egelsbach, Germany	100.00	168	0 ²⁾
KAT	Kaufbeuren ATM Training GmbH	Kaufbeuren, Germany	100.00	100	0 ²⁾
ANS	Air Navigation Solutions Ltd.	London, United Kingdom	100.00	£383 thousand	£95 thousand
DAS Bahrain	DFS AVIATION SERVICES BAHRAIN Co. W.L.L.	Manama, Bahrain	100.00	108 thousand (Bahraini dinars)	516 thousand (Bahraini dinars)
Droniq	Droniq GmbH	Frankfurt, Germany	51.00	8,270	-1,730
Associated companies – measurement using equity method					
FCS	FCS Flight Calibration Services GmbH	Braunschweig, Germany	55.00	4,304 ³⁾	182 ³⁾
AEROSENSE	FREQUENTIS DFS AEROSENSE GmbH	Vienna, Austria	30.00	32 ³⁾	-3 ³⁾
Unify	Unify NV	Antwerp, Belgium	22.80	14,534 ³⁾	-3,090 ³⁾
Investments (non-controlling) – measurement using cost method					
Investment through DFS Deutsche Flugsicherung GmbH:					
GroupEAD	GroupEAD Europe S.L.	Madrid, Spain	36.00	1,926 ³⁾	373 ³⁾
BILSODA	BILSODA GmbH & Co. KG	Pullach, Germany	24.90	2,563 ³⁾	-73 ³⁾
Investment through DFS International Business Services GmbH:					
ESSP SAS	European Satellite Services Provider Société par Actions Simplifiée	Toulouse, France	16.67	12,724 ³⁾	3,647 ³⁾
Investment through DFS Aviation Services GmbH:					
TATS	Tower Air Traffic Services S.L.	Madrid, Spain	50.00	1003 ³⁾	--

¹⁾ There is a profit-and-loss transfer agreement with DFS

²⁾ There is a profit-and-loss transfer agreement with DFS International Business Services

³⁾ Values as at 31 December 2018

Although the DFS Group holds more than half of the shares (55.00%) of FCS Flight Calibration Services, individual provisions of the articles of association as well as the rules of internal procedure for the board prevent the Group from exercising control. It therefore assigns FCS Flight Calibration Services to associated companies and measures the companies using the equity method.

In December 2018, DFS International Business Services founded Droniq GmbH, headquartered in Frankfurt am Main, Germany. In May 2019, the German Federal Cartel Office (*Bundeskartellamt*) approved the commencement of business operations of Droniq after a thorough examination. DFS International Business Services holds 51.00 percent of the registered capital following a cash payment of €1,020,000.00. The other 49.00 percent is held by Telekom Innovation Pool GmbH. The object of the company is the provision, distribution and marketing of services for drones and other aircraft in Europe. The DFS Group recognises Droniq as a consolidated company.

3.3 Other investments

Disclosures on minority shareholders			
Droniq GmbH	Total	DFS Group	Telekom Innovation Pool GmbH
	€'000	€'000	€'000
Share capital	2,000	1,020	980
Shareholding in %	100.00	51.00	49.00
Business year	7 May to 31 Dec		
Accounting standards	HGB		
Income from investments (previous year)	0 (-)	0 (-)	0 (-)
Current assets	8,393	4,280	4,113
Non-current assets	121	62	59
Current liabilities	245	125	120
Non-current liabilities	0	0	0
Equity	8,270	4,218	4,052
Net income	-1,730	-882	-848
Revenues	175	89	86

Disclosures on associated companies				
	FCS	AEROSENSE	Unify	
	€'000	€'000	€'000	
Total registered capital	205 ⁴⁾	35 ⁴⁾	20,918 ⁴⁾	
Shareholding in %	55.00	30.00	22.80	
Additional shareholders	SKYNAV S.A., Belgium, 25.00% AUSTRO CONTROL, Austria, 20.00%	FREQUENTIS AG, Austria, 70.00%	Five managing directors, VITO, Terra Drone, PMV, QBIC Arkiv, QBIC Feeder	
Business year	1 Jan - 31 Dec	1 Jan - 31 Dec	1 Jan - 31 Dec	
Accounting standards	HGB	Austrian Commercial Code	Belgian Commercial Code	
Income from investments (previous year)	0 (0)	0 (0)	0 (0)	
Current assets	2,227 ⁴⁾	35 ⁴⁾	14,997 ⁴⁾	
Non-current assets	11,497 ⁴⁾	0 ⁴⁾	880 ⁴⁾	
Current liabilities	1,618 ⁴⁾	3 ⁴⁾	1,343 ⁴⁾	
Non-current liabilities	7,802 ⁴⁾	0 ⁴⁾	0 ⁴⁾	
Equity	4,304 ⁴⁾	32 ⁴⁾	14,534 ⁴⁾	
Net income	182 ⁴⁾	-3 ⁴⁾	-3,090 ⁴⁾	
Revenues	10,073 ⁴⁾	0 ⁴⁾	258 ⁴⁾	
Disclosures on investments (non-controlling)				
	GroupEAD	BILSODA	ESSP SAS	TATS
	€'000	€'000	€'000	€'000
Total registered capital	1,000 ⁴⁾	10 ⁴⁾	1,000 ⁴⁾	1,000 ⁴⁾
Shareholding in %	36.00	24.90	16.67	50.00
Additional shareholders	Entidad Pública Empresarial Aeropuertos Españoles y Navegación Aérea, Spain, 36.00%; FREQUENTIS AG, Austria, 28.00%	AD Grundstücksgesell- schaft mbH & Co. KG, Germany, 75.10%; BILSODA Beteiligungs GmbH, general partner, Germany, 0.00%	ANSPs from Spain, Italy, United Kingdom and France each hold 16.67%; Portugal and Switzerland, 8.33% each	INDRA Sistemas S.A., Spain, 50.00%
Business year	1 Jan - 31 Dec	1 Jan - 31 Dec	1 Jan - 31 Dec	1 Jan - 31 Dec
Accounting standards	Spanish Commercial Code	HGB	French Commercial Code	Spanish Commercial Code
Income from investments (previous year)	134 (221)	0 (0)	417 (500)	0 (0)
Current assets	2,678 ⁴⁾	458 ⁴⁾	33,986 ⁴⁾	1,003 ⁴⁾
Non-current assets	218 ⁴⁾	6,536 ⁴⁾	2,517 ⁴⁾	--
Current liabilities	970 ⁴⁾	562 ⁴⁾	21,954 ⁴⁾	--
Non-current liabilities	0 ⁴⁾	3,869 ⁴⁾	1,825 ⁴⁾	--
Equity	1,926 ⁴⁾	2,563 ⁴⁾	12,724 ⁴⁾	1,003 ⁴⁾
Net income	373 ⁴⁾	-73 ⁴⁾	3,647 ⁴⁾	--
Revenues	7,211 ⁴⁾	588 ⁴⁾	60,813 ⁴⁾	--
⁴⁾ Values as at 31 December 2018				

4 Accounting policies

The DFS Group carries out accounting and measurement using uniform standards. The consolidated financial statements were drawn up using historical costs unless IFRS prescribed an alternative measurement method. The associated disclosure is made with the respective accounting policy.

4.1 New and amended International Financial Reporting Standards and Interpretations

Revisions to accounting policies resulting from new and revised standards and interpretations are applied retrospectively, unless otherwise regulated. The prior-year statement of comprehensive income and the opening balance sheet for the prior-year period are adjusted as if the new accounting policies had always applied.

4.1.1 Mandatory standards and interpretations

The DFS Group used the following revised and new standards and interpretations that were mandatory for the first time for the business year 2019. The endorsement by the European Union was made with the publication of the standard in the Official Journal of the European Union.

Standard	Title	Publication IASB	EU endorsement	Effective date
New standards and interpretations				
IFRS 16	Leases	13 Jan 2016	31 Oct 2017	1 Jan 2019
IFRIC 23	Uncertainty over income tax treatments	7 Jun 2017	23 Oct 2018	1 Jan 2019
Amendments to existing standards and interpretations				
IFRS 9	Financial instruments (Prepayment features with negative compensation)	12 Oct 2017	22 Mar 2018	1 Jan 2019
IAS 28	Investments in associates and joint ventures (Long-term interests in associates and joint ventures)	12 Oct 2017	8 Feb 2019	1 Jan 2019
IAS 19	Employee benefits (Plan adjustments, curtailments and settlements)	7 Feb 2018	13 Mar 2019	1 Jan 2019
Catalogue	Improvements to International Financial Reporting Standards (2015-2017 cycle)	12 Dec 2017	14 Mar 2019	1 Jan 2019

The interpretation IFRIC 23 and the amendments and clarifications to the standards IFRS 9, IAS 28 and IAS 19 as well as the improvements had no impact on the DFS consolidated financial statements.

On 31 October 2017, the European Union endorsed IFRS 16 into European law. The new standard requires lessees to adopt a new approach to the accounting treatment of leases. It recognises a right-of-use asset and a corresponding lease liability from the time the leased asset is made available for use. The amount is based on the present value of the contractually agreed lease payments for lease contracts with a term of more than 12 months.

For lessors, the previous rules with the differentiation between finance and operating leases remain largely unchanged.

The DFS Group applied the modified retrospective approach to IFRS 16 from 1 January 2019 for the first time. Comparative information was not adjusted. Cumulative effects incurred from the first application were recognised as adjustments to the opening balance sheet values in retained earnings as at 1 January 2019.

During the transition, the DFS Group applied the relief and exemptions allowed. No remeasurement was undertaken for existing contracts on initial application. Initial direct costs were not considered on initial measurement of the rights of use. The determination of the lease term for contracts with an option to extend or terminate was based on current information. The Group took advantage of the relief for short-term leases and continued to recognise the lease payments on a straight-line basis rather than in accordance with IFRS 16. This also applied to leases that ended on 31 December 2019 at the latest, irrespective of their original term. In the case of agreements where the underlying leased asset is of minor value, the DFS Group recognised the lease payments on a straight-line basis over the lease term. The Group waived the impairment test of individual rights of use on initial application and instead availed itself of the simplified approach, reducing them by the amount recognised as a provision for onerous contracts as at 31 December 2018.

Lease liabilities amounting to €25.31 million were recognised on initial application, resulting in a 2.83-percent reduction in net financial assets. The liabilities were discounted as of 1 January 2019, depending on the respective term, using the interest rate for current yields on domestic bonds. In addition, the DFS Group capitalised rights of use for leased assets amounting to €13.35 million on 1 January 2019.

Reconciliation of lease liabilities as at 1 January 2019	Carrying amount as at 1 Jan 2019
	€'000
Financial obligations for operating leases as at 31 December 2018	27,088
Discounting effects	-2,233
Net obligations from operating leases as at 31 December 2018 for additional Group companies	450
Lease liabilities as at 1 Jan 2019	25,305

Accounting changes as at 1 January 2019 under IFRS 16			
Balance sheet line items	Carrying amount as at 31 Dec 2018 before accounting changes	Adjustments from the initial application	Carrying amount as at 1 Jan 2019 after accounting changes
	€'000	€'000	€'000
Property, plant and equipment	499,858	13,346	513,204
Other provisions	391,859	-11,959	379,900
Financial liabilities	236,650	25,305	261,955

4.1.2 Voluntary standards and interpretations

The IASB has published the following revised or new standards and interpretations. The standards have already been incorporated into European law as part of the endorsement procedure. They become effective from the point in time given and early application is permitted.

The Group is currently examining the impact of the new and amended standards on the Group's results and financial position. The Group applies the standards when they become effective and early voluntary application will not be availed of.

Standard	Title	Publication IASB	EU endorsement	Effective date
Amendments to existing standards and interpretations				
Conceptual framework	Amendments to references to the conceptual framework in IFRS standards	29 Mar 2018	29 Nov 2019	1 Jan 2020
IAS 1 / IAS 8	Presentation of financial statements / Accounting policies, changes in accounting estimates and errors (definition of 'material')	31 Oct 2018	29 Nov 2019	1 Jan 2020

On 29 November 2019, the EU adopted amendments to the conceptual framework and to the standards IAS 1 and IAS 8 into European law.

With the amendments to the conceptual framework, the references to previous conceptual frameworks currently contained in several standards and interpretations have been replaced by references to the revised conceptual framework.

With the amendments to IAS 1 and IAS 8, a uniform and clearly defined definition of materiality of financial statement information was created in the standards and supplemented by accompanying examples.

The changes to the concept and the two standards had no effect on the consolidated financial statements.

4.1.3 Published, though not yet mandatory, standards and interpretations

The IASB has issued the following standards which are not yet mandatory. Before these can be applied, they have to be recognised and endorsed by the EU. They become effective from the point of time given.

The DFS Group is currently examining the possible impact on the consolidated financial statements. It does not avail itself of the right of early application of new or amended standards.

Standard	Title	Publication IASB	Expected effective date	Relevant to DFS
New standards and interpretations				
IFRS 14	Regulatory deferral accounts	30 Jan 2014	Not endorsed by EU	Yes
IFRS 17	Insurance contracts	18 May 2017	1 Jan 2021	No
Amendments to existing standards and interpretations				
IFRS 10 / IAS 28	Consolidated financial statements / investments in associates and joint ventures (Sale or contribution of assets between an investor and its associate or joint venture)	11 Sep 2014	Deferred indefinitely	Yes
IFRS 3	Business combinations	22 Oct 2018	1 Jan 2020	Yes
IFRS 9 / IFRS 7 / IAS 39	Financial instruments / Financial instruments: Disclosures / Financial instruments: Recognition and measurement (Interest rate benchmark reform)	26 Sep 2019	1 Jan 2020	Yes

4.2 Items in the statement of comprehensive income

4.2.1 Revenues

The DFS Group recognises revenues if it satisfies its performance obligations through the transfer of the contracted goods and contracted services to the customer. Assets are deemed to have been transferred when the customers have obtained control over the good or service either at a point in time or over time. Revenue is recognised over time if the customer obtains control or receives the benefits as the asset is created or provided, or the asset created does not have an alternative use and there is an enforceable right to payment for performance.

The amount to be recognised is based on the transaction price which can be allocated to the performance obligation. The transaction price can have fixed and/or variable elements and is the consideration to which the DFS Group expects to be entitled in exchange for the transfer of the contracted goods and services to the customer. In the case of multiple performance obligations, the Group allocates the transaction price to the performance obligations in the contract by reference to their relative standalone selling prices. The standalone selling prices are estimated at contract inception on the basis of observable prices of promised products and services supplied under similar circumstances and to similar customers.

The DFS Group determines the level of revenue for revenues recognised over time and fixed-price contracts based on the degree of progress. The Group determines the degree of progress using input methods and uses the cost-to-cost method, by which the costs incurred are compared to the total estimated costs required to satisfy the performance obligation. To determine performance progress, estimates are required of the material influencing factors, such as the overall costs incurred, contract income or contract risks. The expert departments responsible constantly review all the estimates and make any necessary adjustments. The resulting increase or decrease in the estimated revenues and costs are recognised by the Group in the period in which the correction is required.

4.2.2 Impairments

At each balance sheet date, the DFS Group uses the general approach to recognise a risk provision for expected credit losses either on the basis of a 12-month expected credit loss or a lifetime expected credit loss. The general approach has to be applied to financial assets which are either measured at amortised cost or at fair value through other comprehensive income (debt instruments). The expected credit losses are determined from the probability-weighted estimates of the present value of the defaults and are to be discounted at the effective interest rate for financial assets.

Measurement stages of the general approach

Stage 1 12-month expected credit losses

To be used for all financial assets whose credit quality has not significantly deteriorated since initial recognition. 12-month expected credit losses are the expected credit losses that result from default events that are possible within 12 months.

Stage 2/3 Lifetime expected credit losses

These stages are to be used if there has been a significant increase in credit risk for individual financial instruments or for a group of same. Lifetime expected credit losses result from all possible default events over the expected lifetime.

The Group assumes that the credit risk of a financial asset has increased significantly or there is objective evidence of impairment if the debtor has significant financial difficulties, there is a possibility of payments being in default or arrears or the assets of the debtor are subject to insolvency proceedings. If there is such evidence on initial recognition, these assets are allocated to stage 3 from the beginning. The DFS Group views the assets measured at amortised cost or at fair value through other comprehensive income as having a low credit risk as it considers the risk of non-performance to be low and the debtor is always in a position to meet its contractual payment obligations at short notice.

Under the simplified approach, the DFS Group recognises a loss allowance based on lifetime expected credit losses both on initial recognition and at each reporting date. The Group uses this approach for trade receivables, contract assets and lease receivables. The determination is based on the analyses of the age structure and due dates, information on insolvencies or the use of a provision matrix based on historically observed default rates. As further security, the Group demands security deposits from customers with relevant sales volumes when defined warning thresholds are exceeded. The Group recognises the allowances for doubtful accounts in a separate allowance account. Such allowances are reversed through the income statement should the reasons for the impairment no longer apply in subsequent periods. The Group views a receivable as being in default if, in its reasonable opinion, it will no longer be paid and the debtor is unlikely to be able to settle its credit obligations in full.

All other assets (goodwill, intangible assets, property, plant and equipment, and investment property, financial assets) are reviewed on each balance sheet date to see if there are indications for an impairment under IAS 36. This involves comparing the carrying amount with the recoverable amount of the asset.

An impairment loss is recognised for the amount by which the recoverable amount exceeds the carrying amount of the asset. The recoverable amount is the higher of the net realisable value and the value in use. The net realisable value is equal to the fair value less costs to sell. Value in use is the present value of the future cash flows expected to be derived from the continuing use of an asset. The Group calculates the present value with a discount rate before tax that reflects market conditions, calculated using the estimated zero-coupon curves of the German Bundesbank (the Svensson method is used). No risk premium in accordance with IAS 36.55(b) is used, as the assets are not exposed to any special risks. If a recoverable amount cannot be determined for an individual asset, the Group brings together the assets into cash generating units, the smallest identifiable group of assets.

If, at a later date, the reasons for impairments made in previous years no longer apply, either in full or in part, the impairment loss is reversed accordingly. The reversal is limited to the carrying amount which would have applied if the impairments from the past were excluded and it is recognised in the income statement. A reversal of impaired goodwill is not permitted.

4.2.3 Operating expenses

Operating expenses are recognised in the income statement when the service is used or at the time the expenses are incurred.

4.2.4 Interest income and expenses

Interest income and expenses are recognised on an accrual basis using the effective interest rate method.

4.3 Items in the balance sheet

4.3.1 Goodwill

The DFS Group recognises goodwill from business combinations in accordance with IFRS 3 as an asset at cost at the acquisition date. Cost is the difference between the purchase price for the shares and the proportionate net assets acquired. The net assets are the difference between the fair values of the identifiable assets acquired and the liabilities assumed as well as the contingent liabilities. Acquisition-related costs are expensed.

There is no scheduled amortisation for goodwill. Goodwill is reviewed at every balance sheet date to determine if there are indications of impairment. Impairment testing involves comparing the carrying amount with the recoverable amount of the asset. The tests are conducted at the level of the cash generating unit. The recoverable amount is determined using recognised discounted cash flow methods. If the recoverable amount is lower than the carrying amount, an impairment loss is recognised down to the recoverable amount in accordance with IAS 36. Once goodwill has been impaired, it is not permitted to reverse the impairment in subsequent periods.

4.3.2 Intangible assets

Assets acquired for valuable consideration are capitalised at cost when it is probable that the asset will generate future economic benefits for the company and the costs can be measured reliably.

Intangible assets that arose from own development activities are capitalised at cost. This presupposes that future economic benefits will be generated from the products. Production costs comprise all direct costs and an appropriate share of development-related overhead. Borrowing costs are capitalised as part of production costs in accordance with the requirements of IAS 23. Impairment tests are carried out on internally generated intangible assets to determine the present value of expected future cash flows if there are objective indications of impairment. The Group evaluates current requirements due to changing market conditions as well as the progress of new intangible assets that are already in the development process.

Prepayments are measured at cost. The prepayments are allocated to the respective intangible assets at the time of commissioning and written off over their useful life.

Intangible assets have a limited useful life. They are written off on a straight-line basis from the beginning of use as follows:

Intangible assets	Useful life
Concessions, industrial and similar property rights and assets as well as licences in such rights and assets	3 to 8 years
Internally generated intangible assets	8 years
Prepayments	Only after commissioning

Research expenses and associated government grants are recognised in profit or loss. Grants from airports, other air navigation service providers or the Paul Ehrlich Institute are deducted from cost. EU grant funding from the Connecting Europe Facility (CEF) programme is recognised as accruals and recorded in profit or loss over the useful lives of the underlying property, plant and equipment.

4.3.3 Property, plant and equipment

Tangible assets acquired for valuable consideration are capitalised at cost when it is probable that the asset will generate future economic benefits for the company and the costs can be measured reliably.

Costs include the purchase price as well as all directly attributable costs required to bring the asset to the site and get it into the working condition as intended by management.

The DFS Group divides property, plant and equipment (in particular buildings) into the material economic components and reports them separately. Costs for the replacement of components and general overhaul are capitalised separately.

Production costs for internally generated property, plant and equipment comprise direct production costs (prime costs), an appropriate share of manufacturing overhead as well as the borrowing costs that are directly attributable up to the time of completion in accordance with IAS 23.

Government grants are deducted from the carrying amount of the grant-funded asset. Grants from airports, other air navigation service providers or the Paul Ehrlich Institute are deducted from cost. EU grants from the CEF programme are recognised as accruals and recorded in profit or loss over the useful lives of the underlying property, plant and equipment.

All assets (except for land) have a limited useful life and are written off on a straight-line basis from the beginning of use. The DFS Group estimates the useful lives of property, plant and equipment based on their probable usability. As an orientation, it uses the official tax depreciation table (*AfA-Tabelle*) for general purpose assets (see letter from the German Federal Ministry of Finance (BMF) dated 15 December 2000 in the Federal Tax Gazette (*Bundessteuerblatt*) I 2000, p. 1,532). Adjustments are made, as necessary, based on historical experience.

Property, plant and equipment	Useful life
Building – Structure	40 years
Building – Façade	25 to 30 years
Building – Interior finishing	25 years
Building – Heating, ventilation, water	15 years
Building – Electronics	15 years
Outside facilities	5 to 19 years
Technical equipment	3 to 20 years
Operating and office equipment	3 to 15 years

Costs for repairs and ongoing maintenance of property, plant and equipment that have not led to an extension or material improvement are recognised under other operating expenses in the income statement.

When property, plant and equipment are sold, decommissioned or scrapped, any gains or losses from the difference between the net disposal proceeds and the amortised cost are recognised in other operating income or expenses.

4.3.4 Financial assets accounted for using the equity method

The DFS Group recognises associated companies at cost at the acquisition date using the equity method. In subsequent periods, the carrying amount is adjusted to account for the associated changes in equity in profit or loss, or in other comprehensive income. The dividends received from associated companies are accounted for by lowering the carrying amount of the investment. If there are indications for an impairment of investments, the lower recoverable amount is used for the carrying amount as required by the regulations of IAS 36.

4.3.5 Leases

As a lessee, the DFS Group measures the rights of use granted to it for leased assets at cost on initial recognition on the commencement date. These are calculated as the present value of future lease payments. Subsequently, the rights of use are measured using the cost method and amortised on a straight-line basis over the shorter of the useful life and the expected term of the lease agreement. If there is a remeasurement of the lease liabilities, the rights of use are adjusted accordingly. Rights of use are reviewed at every balance sheet date to determine if there are indications of impairment under IAS 36.

As a lessee, the Group determines the lease liabilities on initial recognition on the commencement date from the present value of the lease payments not yet made at that date. These payments primarily comprise fixed and variable payments, expected residual value payments and exercise payments for purchase options. The lease payments are discounted at an incremental borrowing rate. This discount rate is based on the yields on debt securities outstanding issued by residents, public debt securities and listed Federal securities corresponding to their remaining term as published by the German Bundesbank. An internal company credit risk premium of 0.25 percent is added. On subsequent measurement, the lease liabilities are increased by the interest expense passed through the income statement and reduced by the repayment portion, which does not pass through the income statement. Each lease payment is divided into repayment and financing expenses. If there are changes in the lease payments (e.g. due to index-linked charges, changes in the term of the lease or reassessments of contractual options), the DFS Group remeasures the lease liabilities.

Adjustments to the new carrying amounts are generally made without going through profit and loss by making corresponding corrections to the capitalised rights of use.

As a lessee, the group shows the rights of use under "Property, plant and equipment" and the lease liabilities under "Financial liabilities". The rights of use and associated depreciation, as well as lease liabilities and corresponding interest expenses, are presented in a separate item in the Notes.

Lease transactions where the DFS Group, as lessor, transfers basically all the risks and rewards of ownership of a leased asset to the lessee are treated as finance leases. At the beginning of the lease, the group derecognises the leased asset. At the same time, as lessor, it recognises a lease receivable in the amount of the net investment in the lease on the commencement date. The net investment comprises the present value of the lease payments, the present value of the expected residual value at the end of the lease and the initial direct costs. Subsequently, finance income is recognised over the lease term as a constant periodic rate of return on the net investment. The lease payments received reduce the lease receivable.

All other lease agreements where the Group is a lessor are treated as operating leases. The lease instalments received and the depreciation of the leased asset are recognised in the income statement on a straight-line basis over the term of the lease.

The DFS Group makes use of simplifications and waives the application of IFRS 16 for short-term leases (especially vehicle leases) and for leases where the underlying asset is of minor value. The Group set a threshold of five thousand euro. The lease payments for these transactions continue to be recognised in the income statement on a straight-line basis over the term of the lease. In addition, the Group generally separates leasing and non-leasing components and recognises the latter in the income statement.

The DFS Group applied IFRS 16 retrospectively, but decided not to adjust the prior-year figures. Until 1 January 2019, the Group valued the rental and lease agreements in accordance with IAS 17 and assessed them as regards their accounting treatment (finance leases through the balance sheet and operating leases through the income statement).

Measurement of leases until 1 January 2019

Lease transactions where the DFS Group, as lessee, bore basically all the risks and rewards of ownership of a leased asset were treated as finance leases. The Group therefore capitalised the leased object at the lower of the fair value or the present value of the minimum lease payments. Subsequently, the leased asset was written off over the shorter of the term of the lease or the estimated useful life. The DFS Group recognised the payment obligations resulting from future lease instalments under financial liabilities at the corresponding value of the leased asset. The minimum lease payments were split between a principal component and an interest component, with the interest being calculated using the effective interest rate method.

All other lease agreements where the Group was a lessee were treated as operating leases. The lease payments were expensed over the term of the lease arrangement on a straight-line basis.

4.3.6 Investment property

Property and buildings that the DFS Group does not use operationally and are exclusively held either for rental income or capital gains are classified as investment property. The amortised cost is used for measurement. Buildings are depreciated using the straight-line method.

4.3.7 Financial instruments – Financial assets

The DFS Group determines the classification and measurement of financial assets based on the business model by which the portfolio of financial assets is managed and on the characteristics of the contractual terms of the cash flows.

- Category: Amortised cost

The Group classifies financial assets under this category when the objective is to hold the asset to maturity and collect the contractual cash flows. The cash flows occur at fixed points in time and represent exclusively repayments of principal and interest on the outstanding principal amount. Initial recognition occurs at fair value at the time of settlement (plus direct transaction costs). Receivables denominated in a foreign currency are translated using the rate at the reporting date and recognised in the income statement. Subsequently, the assets are carried at amortised cost using the effective interest rate method. Due to the predominantly short-term nature of trade receivables, other receivables and assets as well as liquid funds, the carrying amounts at the balance sheet date do not differ significantly from their fair values. The Group therefore assumes that these assets can be sold for at least their carrying amounts in the short term and sets their fair values at the same level. Interest income and exchange rate gains and losses are presented in the financial result. Gains and losses from impairments, derecognitions and modifications are recognised in the operating result.

- Category: Debt instruments at fair value through other comprehensive income

For debt instruments in this category, the Group's objective is either to hold the asset to maturity and collect the contractual cash flows, or to sell. The cash flows occur at fixed points in time and represent exclusively repayments of principal and interest on the outstanding principal amount. At the time of settlement, initial recognition occurs at fair value (plus direct transaction costs). Subsequently, the DFS Group measures the financial assets at fair value through other comprehensive income, with changes to the carrying amount being booked in other comprehensive income. On disposal, accumulated other comprehensive income is reclassified to profit or loss. Interest income and exchange rate gains and losses calculated using the effective interest rate method are recognised directly in the financial result, while impairment losses are recognised in a separate item in the operating result.

- Category: Equity instruments at fair value through other comprehensive income

For investments in equity instruments, the Group's objective is also either to hold these to maturity and collect the contractual cash flows, or to sell. The cash flows occur at fixed points in time and represent exclusively repayments of principal and interest on the outstanding capital amount. On initial recognition of an equity investment that is not held for trading, the Group may irrevocably elect to measure it at fair value through other comprehensive income. This choice is made on a case-by-case basis for each investment. Initial recognition occurs at fair value (plus direct transaction costs). Subsequently, the investment is measured at fair value. The Group recognises all changes to the fair value directly in other comprehensive income. On derecognition of the investment, there is no reclassification of the cumulative other comprehensive income in the operating result. Dividends are considered in the financial result.

- Category: Assets at fair value through profit or loss

The DFS Group recognises all financial assets at fair value through profit or loss (excluding transaction costs) on initial recognition as long as they are not measured at amortised cost or at fair value through other comprehensive income. Subsequently, these assets are measured at fair value through profit or loss. All net gains and losses are recognised directly in other comprehensive income. Interest and dividend income are considered in the financial result.

Derivatives also belong to this category unless they qualify as hedging instruments. The DFS Group exclusively employs effective derivatives to hedge existing and future interest rate and currency risks under a hedging policy defined by the Board of Managing Directors and monitored by the Treasury department. While interest rate swaps are used to manage interest risk, cross-currency interest rate swaps hedge both interest rate risk and currency risk from financing in foreign currencies.

A reclassification is only carried out if the business model objective for the financial assets is changed.

The Group recognises expected credit losses under IFRS 9. The impairment method depends on whether there is a significant rise in the credit risk (see Note 4.2.2). The simplified approach is used for trade receivables, contract assets and lease receivables.

The Group derecognises financial assets as soon as the contractual right to the cash flows expires or the asset is transferred as part of a qualified transfer.

4.3.8 Fair value

The fair value of financial instruments is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date (exit price). The fair value is measured based on the assumptions that knowledgeable market participants who are independent of each other and who are willing and able to enter into a transaction would make while acting in their economic best interest. Fair value is a market-based measurement, not an entity-specific measurement.

The fair value measurement assumes that the transaction is made in the principal market for the asset or liability. In the absence of such a market, the most advantageous market is to be used. This is the market that would maximise the amount that would be received to sell an asset or minimise the amount that would be paid to transfer a liability, taking into consideration transport and transaction costs. However, fair value measurements are not adjusted for transaction costs.

The DFS Group uses valuation techniques to determine fair value that are appropriate under the given circumstances and for which sufficient data are available. The techniques maximise the use of relevant observable inputs and minimise the use of unobservable inputs.

Inputs

Level 1 **Directly observable inputs**

Observable (unadjusted) quoted prices in accessible active markets for identical assets or liabilities.

Level 2 **Indirectly observable inputs**

Inputs that are observable for assets or liabilities either directly or indirectly.

- a) Quoted prices for similar assets or liabilities in active markets.
- b) Quoted prices for identical or similar assets or liabilities in markets that are not active.
- c) Inputs other than quoted market prices that are observable.
- d) Market-corroborated inputs (values derived from market data using statistical methods).

Level 3 **Unobservable inputs**

Entity's own assumptions on the behaviour of a typical market participant.

The DFS Group undertakes reclassifications within the hierarchy at the end of the business year in which the changes took place.

Valuation techniques**Market approach**

This approach derives market multiples from a set of identical or comparable assets (matrix pricing).

Cost approach

This approach is based on the amount required to replace the service capacity of an asset (the current replacement cost).

Income approach

This method discounts future cash flows to a current amount (present value techniques, option pricing models, residual income method).

Further information on the determination of the fair value can be found in Notes 19 and 36.

4.3.9 Trade receivables

Initial recognition occurs at fair value at the time of settlement (plus direct transaction costs). The transaction price is the consideration to which the DFS Group expects to be entitled in exchange for the transfer of the contracted goods and services to the customer. Subsequently, trade receivables are measured at amortised cost using the effective interest rate method taking impairments into consideration (see Note 4.2.2). Due to their predominantly short-term nature, the carrying amounts at the balance sheet date do not differ significantly from their fair values. The DFS Group therefore assumes that trade receivables can be sold for at least their carrying amounts in the short term and sets the fair value at the same level.

Trade receivables denominated in a foreign currency are translated using the rate at the reporting date and recognised in the income statement.

4.3.10 Contractual net values

Contract assets relate to a right that the Group has to consideration in exchange for goods or services that, at the balance sheet date, have been transferred but not invoiced for contracts over time.

The Group capitalises the additional costs for obtaining contracts with a customer as an asset when it can assume that the costs will be recovered. The costs of fulfilling contracts are also capitalised under certain conditions.

Contract liabilities relate to customer payments already made (security deposits of airspace users) where the DFS Group still has to provide the contracted good or service. The DFS Group presents amounts received or that will be received that are expected to be refunded to the customer (expected volume discounts or product returns) as refund liabilities. This is based on empirical values relating to return percentages and periods.

4.3.11 Other receivables and assets

Initial recognition occurs at fair value at the time of settlement (plus direct transaction costs). The transaction price is the consideration to which the DFS Group expects to be entitled in exchange for the transfer of the contracted goods and services to the customer. Subsequently, other receivables and assets are measured at amortised cost using the effective interest rate method taking impairments into consideration (see Note 4.2.2). Due to their predominantly short-term nature, the carrying amounts at the balance sheet date do not differ significantly from their fair values. The DFS Group therefore assumes that the receivables can be sold for at least their carrying amounts in the short term and sets the fair value at the same level.

Other receivables and assets in foreign currencies are measured at the reporting date and recognised in the income statement.

4.3.12 Deferred taxes

IAS 12 regulates the treatment of deferred taxes using the liability method. Deferred tax assets and liabilities are recognised by the DFS Group for all temporary differences between the tax base of assets and liabilities and their carrying amounts in the Group balance sheet according to IFRS as well as for consolidation adjustments recognised in profit or loss. The differences are limited to those items whose changes influence taxable earnings.

Issues related to the calculation of charges are excluded (see Section 31b(3)(3) of the German Aviation Act (LuftVG)).

Deferred tax assets are also recognised for future claims to tax reductions resulting from tax loss carryforwards. Deferred tax assets for deductible temporary differences and for tax loss carryforwards are only recognised to the extent that there are future taxable profits which either the temporary differences or unused taxable losses can offset.

The computation of deferred taxes is based on the existing or applicable income tax rates in each country at the date of valuation. The income tax rate of 29.83 percent (previous year: 29.83%) is made up of a corporate income tax of 15.00 percent, a solidarity surcharge of 5.50 percent and a weighted average German municipal trade tax multiplier rate of 400.00 percent on a tax rate (*Steuermessbetrag*) of 3.50 percent. The effect of changes in tax rates on deferred tax assets and liabilities is reflected in the income tax expense for the period in which the law was changed.

Deferred tax assets and liabilities are netted if permitted under law and the receivables and payables are against the same tax authority.

Deferred tax assets and liabilities are not discounted.

4.3.13 Liquid funds

Liquid funds include cash, cash accounts as well as short-term money market investments and certificates of deposit at credit institutions. Initial recognition occurs at fair value at the time of settlement (plus direct transaction costs). Subsequently, liquid funds are measured at amortised cost. Due to the predominantly short-term nature of cash and cash equivalents, they are only subject to immaterial changes in value. The Group therefore sets the fair values at the same level as the carrying amounts.

Liquid funds in foreign currencies are converted at the closing rate.

Overdrafts taken up are reported by the DFS Group in the balance sheet as liabilities to credit institutions under current financial liabilities.

4.3.14 Inventories

Inventories are carried at cost based on the weighted average method or at production cost.

Production costs comprise direct production costs (especially direct materials and direct labour) as well as an appropriate share of the necessary material and manufacturing overhead. Administrative expenses and costs of employee assistance programmes are included to the extent they can be allocated to production. Financing costs are not recognised as part of production costs.

Subsequent measurement occurs at the lower of deemed cost and net realisable value. Inventory risks resulting from the duration of storage or impaired usability led to write-downs upon determination of the net realisable value. If the reasons for a write-down no longer apply, the write-down is reversed. Lower values at the reporting date due to lower prices on sales and purchase markets were taken into account.

4.3.15 Other comprehensive income

This item relates to changes recognised directly in equity, provided they are not based on capital transactions with the Shareholder. This includes remeasurement components of the net defined benefit liability, unrealised gains and losses from the fair valuation of available-for-sale financial assets, measurement differences from currency translation and the associated tax effects. In equity, these items are disclosed under revaluation reserves.

4.3.16 Provisions for pensions and similar obligations

Defined benefit plans are measured in accordance with IAS 19 using the projected unit credit method on the basis of actuarial reports at the balance sheet date. This requires, in particular, assumptions to be made about long-term salary trends and average life expectancy, which are made at the beginning of the business year. The premises on salary trends are based on historical trends and take into account country-specific interest and inflation levels. Biometric data serve as the basis for the estimates of average life expectancy (mortality tables taken from Heubeck-Richttafeln 2018 G).

The discount rate is an actuarial assumption and is set at the beginning of each business year. The rate used to discount pension obligations is determined by reference to market yields at the end of the reporting period on high-quality fixed-rate corporate and treasury bonds with good creditworthiness and an average rating of AA using the standardised approach. The DFS Group used bonds that are measured in euro. The term of the corporate bonds corresponds to the term of the obligation. With the help of the interest rate, the Group calculates the net interest result, for which the net pension obligation or net defined benefit liability is multiplied by the interest rate. The net pension obligation results from the deduction of plan assets with their fair value from the gross pension obligation and is therefore a net amount. In the event of an asset surplus (i.e. a net defined benefit asset), a corresponding procedure is applied. The interest rate for the expected return on plan assets therefore corresponds to the discount rate. Before offsetting, the DFS Group reports the net interest result in the financial result under financial income and financial expenses.

Remeasurements of the net defined benefit liability are recognised directly in equity in other comprehensive income. This includes in particular the actuarial gains and losses resulting from changes in expectations as regards the estimates made at the beginning of the year compared with the actual development during the business year. In addition, a portion of the actual return on plan assets at the end of the year in excess of the expected return on plan assets at the beginning of the year is recognised directly in equity. The remeasurements recognised in equity cannot be recognised in profit or loss in the following periods.

The service cost is made up of the current and past service costs. The latter reflects the change in pension obligations as a consequence of plan adjustments and plan curtailments. It is recognised directly in profit or loss when incurred in the statement of comprehensive income and reported under employee expenses.

The development of plan assets is made up of the contributions, payments and income from a matched reinsurance contract. The reinsurance contract requires an investment in line with the investment guidelines under the general cover fund of the insurer as well as a separate fund-based investment. This fund-based investment allows the DFS Group's contract with the insurer to have a higher equity ratio to gain a long-term increase in return compared with the return provided by the general cover fund of the insurance consortium. The fund investment is restricted to a maximum of half of the whole capital reserve of the reinsurance contract. The expectations placed on the fund investment are formulated by a strategy commission. It considers the latest expectations for the capital markets and risk issues. Pension obligations for which there are plan assets are netted against the fair value of these plan assets.

No provisions are recognised for defined contribution plans. The level of contributions at the DFS Group is dependent on the income relevant to pension calculations. The payments for defined contribution plans are expensed when due and reported as part of employee expenses.

4.3.17 Other provisions

The DFS Group recognises other provisions for past events that result in present obligations to third parties. These provisions must be capable of being estimated reliably and must lead to an outflow of resources with economic benefits in the future with a probability of at least 50.00 percent. The provisions are recognised with the settlement amount, which represents the highest probability of occurrence based on best estimates and under consideration of all discernible risks. In addition, the measurement of other provisions requires judgements on estimated costs, expected cash flows and their maturities. The provisions relate primarily to contracts, collective agreements, legal provisions or other obligations. They are recognised based on financial and actuarial calculations or historical experience using prudent commercial judgement. The premises underlying other provisions are reviewed annually and adjusted to current circumstances as necessary.

The DFS Group expects the majority of the other provisions to fall due in the next one to five years. Some of the individual provisions may involve a time period up to 2041. Therefore, uncertainties remain as to the timing and concrete amount of the expenses. Nevertheless, the Group expects to utilise the full amount of the provisions (100.00%) and expects that the outflow of economic benefits will equal the amount set aside in the provisions.

Provisions for obligations which in all probability will not lead to a reduction in assets in the subsequent year are discounted at prevailing market rates and carried at the present value of the expected outflow of resources, provided the interest effect is material. The discount rates are based on the yields on debt securities outstanding issued by residents, public debt securities and listed Federal securities corresponding to their remaining term as published by the German Bundesbank. In addition to these yields, a company-internal risk premium of 0.25 percent is added. The discount rates for non-current provisions are adjusted to the development of interest rates in the business year.

If a change in an estimate results in a reduction of the obligation, then the provision is reversed proportionally and the income reported under other operating income.

4.3.18 Financial instruments – Financial liabilities

Financial liabilities generally give rise to a claim for repayment in cash or in the form of another financial asset.

- Category: Liabilities at fair value through profit or loss

The DFS Group recognises derivative financial instruments with negative market values and financial liabilities at fair value on initial recognition if they are held for trading with the intention of sale in the short term. Subsequently, financial debt is measured at fair value. All gains and losses are directly included in the operating result and interest expenses in the financial result.

- Category: Amortised cost

The category contains all financial liabilities which cannot be allocated to another category. Initial recognition occurs at fair value (plus direct transaction costs). Subsequently, the DFS Group measures financial liabilities at amortised cost using the effective interest rate method. Interest income and exchange rate gains and losses are presented in the financial result. Gains and losses from derecognitions are recognised in the operating result.

For financial liabilities with maturities up to one year, the carrying amounts at the balance sheet date do not differ significantly from their fair values. If the maturity is longer than one year, the fair value is calculated by discounting the settlement value at a risk-free rate using the effective interest rate method.

The Group derecognises financial liabilities when they are discharged or when the contractual obligations are met, cancelled or expire.

Liabilities denominated in a foreign currency are converted using the rate at the reporting date.

4.4 Currency translation

The DFS Group presents its consolidated financial statements in the reporting currency euro. Unless otherwise stated, all amounts are given in thousands of euro (€'000) and rounded using the common method.

The Group translates foreign currency transactions into the functional currency of the individual unit using the rate prevailing at the date of the transaction. After initial recognition, foreign currency fluctuations for monetary items (liquid funds, receivables, liabilities) are recorded in profit or loss and non-monetary items (intangible assets; property, plant and equipment; inventories) are carried at historical cost using the exchange rate at the date of the transaction.

The DFS Group translates the financial statements of foreign subsidiaries (as well as the hidden reserves and obligations identified in purchase price allocations) using the concept of a functional currency under IAS 21. The current rate method (mean exchange rate at the balance sheet date) is used to translate assets, liabilities, contingent liabilities and other financial obligations. The translation of items for the income statement, however, uses a rate that approximates the exchange rate at the date of the transaction (average exchange rate). The exchange difference from the translation of equity and the differences from the translation into the presentation currency are recognised directly in other comprehensive income by the DFS Group.

Currencies	ISO code	Standard conversion Mean exchange rate 31 Dec 2019	EMU conversion Asked price 31 Dec 2019	Standard conversion Mean exchange rate 31 Dec 2018	EMU conversion Asked price 31 Dec 2018
	1 euro =				
US dollar	USD (\$)	1.12340	1.12640	1.14500	1.14800
Pound sterling	GBP (£)	0.85080	0.85280	0.89453	0.89653
Swiss franc	CHF	1.08540	1.08740	1.12690	1.12890

4.5 Use of assumptions and discretionary decisions

At the balance sheet date, the DFS Group makes annual forecasts of future developments for accounting and measurement purposes. The comprehensive set of assumptions, estimates as well as judgements and discretionary decisions made may have a considerable influence on the representation of the results and financial position of the DFS Group. They are based on historical experience and expectations about the occurrence of future events which appear commercially reasonable in the given circumstances. The Group continuously verifies its estimates and prognoses. If external conditions develop differently than expected, the actual amounts may vary from the estimates. Any variances from the actual circumstances are recognised in profit or loss when they occur. The discretionary decisions on assumptions concerning the future and other key sources of estimation uncertainty at the balance sheet date which have a significant risk of causing a material adjustment to the carrying amounts of assets and liabilities within the next business year are described in the respective accounting policies.

4.6 Changes to the presentation of prior-year values

In the consolidated cash flow statement, the prior-year figures were adjusted for unrealised or non-cash interest from the UI Fund.

Adjustments to the cash flow statement 2018			
Line items	Values as at 31 Dec 2018 before adjustments	Adjustments	Values as at 31 Dec 2018 after adjustments
	€'000	€'000	€'000
Interest	16,568	-17,334	-766
Cash outflow from operating activities	-180,992	-17,334	-198,326
Financial result	-17,334	+17,334	0
Cash outflow for financing activities	183,793	+17,334	201,127

Notes to the statement of comprehensive income

5 Revenues

	2019	2018
	€'000	€'000
Revenues from air navigation services	1,007,404	1,027,652
Other revenues	102,313	79,401
	1,109,717	1,107,053

Breakdown of revenues from contracts with customers

	Regulated business	Commercial business	Total
31 Dec 2019	€'000	€'000	€'000
Revenues from contracts with customers	1,022,667	87,050	1,109,717
Time point of revenue recognition			
Recognised at a specific point in time	1,018,551	75,608	1,094,159
Recognised over a period of time	4,116	11,442	15,558
31 Dec 2018	€'000	€'000	€'000
Revenues from contracts with customers	1,041,814	65,239	1,107,053
Time point of revenue recognition			
Recognised at a specific point in time	1,040,501	60,622	1,101,123
Recognised over a period of time	1,313	4,617	5,930

Transaction price assigned to performance obligations not (or only partially) satisfied at the year end

	2019	2018
	€'000	€'000
Outstanding transaction price	9,439	16,197
of which expected to be recognised as revenue in 2020	6,164	10,420
of which expected to be recognised as revenue in 2021	2,738	3,059
of which expected to be recognised as revenue in 2022	307	1,709
of which expected to be recognised as revenue in 2023	77	780
of which expected to be recognised as revenue in 2024	77	76
of which expected to be recognised as revenue in 2025	76	76
of which expected to be recognised as revenue in 2026	0	77

Type of service	Type and time of satisfying the performance obligation and material payment conditions	Revenue recognition under IFRS 15
Air navigation services	<p>The air navigation services and the directly associated support activities derive from the sovereign task from Section 27c of the German Aviation Act (LuftVG). Airspace users obtain control in the accounting sense of the air navigation services as soon as they enter the airspace controlled by DFS and make use of the associated services.</p> <p>For terminal services, the Group issues statutory notifications of charges (<i>Gebührenbescheide</i>) to airspace users three times per month for each short cycle. The notifications are immediately due in full within five days of the due date. However, the Group grants airspace users a period of one month to appeal against notifications.</p> <p>For en-route services, the invoices are issued by EUROCONTROL in arrears in the middle of the subsequent month. The notifications are due within 30 days. Airspace users are granted a period of one month to appeal.</p>	Revenue is recognised when the airspace users make use of the air navigation services.
Production and service contracts	<p>In the commercial business, the Group markets air navigation services and air traffic control systems that are often offered in combination with hardware and software, consultancy, training as well as analysis, simulation and project management activities worldwide. Therefore, these contracts contain several performance components. The DFS Group views the contracts as one performance obligation each as it is responsible for the complete project management and has contractually promised to provide the goods or services to the customer. The development, installation and maintenance of the customer-specific air traffic control software can only be carried out by the Group.</p> <p>Some of the projects extend over a longer period of time. Some customers make advance payments. The final invoice is issued on acceptance and the associated transfer of control to the customer. The production and service contracts do not contain a significant financing component as the customary 30-day payment period for invoices and advance payments has been agreed.</p>	<p>The revenues from consultancy services are recognised in the period in which the services are rendered.</p> <p>For fixed-price contracts and the recognition of revenue over time, the amount is calculated using the cost-to-cost method. The degree of progress is determined by comparing the costs incurred to the total estimated costs required to satisfy the performance obligation. Estimates of revenues, costs and contract progress are corrected when conditions change. The resulting increase or decrease in the estimated revenues and costs are recognised by the Group in the period in which the correction becomes known. Fixed-price contracts have a payment plan with fixed deadlines and amounts. If the services rendered exceed the payment amount, the Group recognises a contract asset, or a contract liability in the opposite case. Advance payments received are presented as contract liabilities.</p> <p>The costs are expensed as they occur.</p>

6 Changes in inventory and other own work capitalised

	2019	2018
	€'000	€'000
Changes in inventory of finished goods and work in progress	-1,737	-297
Other own work capitalised (primarily internally generated IT systems)	20,325	17,745
	18,588	17,448

7 Other operating income

	2019	2018
	€'000	€'000
Income from QTE transaction (exchange rate gains)	8,801	9,535
R&D project funding by the European Commission and German Federal and regional ministries recognised in the income statement	26,658	26,462
Income from derecognition of liabilities	4,488	3,846
Income from reversal of provisions	6,224	9,061
Remaining	6,581	4,515
	52,752	53,419

8 Material expenses

	2019	2018
	€'000	€'000
Raw materials, consumables used and purchased goods	4,438	4,000
Purchased services (flight inspection and consulting services)	6,495	8,492
	10,933	12,492

9 Employee expenses

	2019	2018
	€'000	€'000
Wages and salaries ⁵⁾	660,291	620,960
Expenses for IFRS pensions	195,916	182,671
Social security costs and expenses for assistance	70,489	66,749
Cost of personnel belonging to the Federal Aviation Office (LBA)	8,531	8,483
	935,227	878,863

⁵⁾ See Note 46.1 for the remuneration of the Board of Managing Directors

In addition to the usual outlays for wages, salaries and social security expenses for DFS personnel, this item also includes the costs charged by the Federal Aviation Office (LBA) for personnel belonging to the LBA.

Average annual number of employees		
	2019	2018
Salaried staff	5,396	5,197
Soldiers released from regular service	155	161
Wage-earners	20	21
Technical and commercial students and apprentices	244	148
DFS Group staff	5,815	5,527
Employees covered by the collective agreement for the public service (TVöD)	25	29
Established civil servants	109	114
Personnel belonging to the Federal Aviation Office (LBA), Directorate Air Navigation Services	134	143
	5,949	5,670

10 Depreciation and amortisation

	2019	2018
	€'000	€'000
Intangible assets	29,568	47,577
Property, plant and equipment	74,539	69,619
Investment property	30	30
	104,137	117,226

The impairment tests carried out in the business year resulted in no impairment charges being recognised for intangible assets; property, plant and equipment; investment property and financial assets.

11 Impairment losses on financial assets and contract assets

	2019	2018
	€'000	€'000
Financial assets	4,811	934
Contract assets	0	0
	4,811	934

12 Other operating expenses

	2019	2018
	€'000	€'000
Spare parts and maintenance	54,020	52,016
Occupancy costs	14,924	14,793
Rent and leasing costs	2,453	4,208
Reimbursement of expenses at cost price	4,182	4,304
Costs of external personnel	13,417	11,452
Other employee expenses	12,948	9,526
Legal and consultancy costs	7,308	6,382
Travel costs	8,120	7,689
Telecommunication	9,419	7,339
Costs from previous years	1,162	2,115
Vehicle costs	3,307	3,511
Asset disposals	1,974	1,007
Insurance policies	3,774	2,994
Magazines, journals, stationery	1,358	1,075
Advertising costs	2,705	2,518
Entertainment expenses	1,266	1,155
Costs of monetary transactions	3,691	1,956
Expenses from QTE transaction (exchange rate losses)	8,805	9,554
Remaining	2,048	1,424
	156,881	145,018

13 Financial result

	2019	2018
	€'000	€'000
Income from fund assets to finance retirement obligations	51,892	46,362
Gains from the financial assets of the investment entity	161,601	71,014
Interest income from QTE transaction	836	997
Other interest income	586	549
Income from foreign currency translation	3	6
Income from investments	551	721
Interest income from operating taxes	2	0
Financial income	215,471	119,649
Expenses from discounting provisions	-88,566	-83,787
Expenses from the financial assets of the investment entity	-57,222	-84,482
Other interest expense	-3,649	-3,795
Interest expense from QTE transaction	-672	-804
Interest expense from operating taxes	0	-814
Expenses from securities	0	-26
Financial expenses	-150,109	-173,708
Financial result	65,362	-54,059

Additional disclosures on the financial result

	2019	2018
	€'000	€'000
Interest result from financial instruments determined using the effective interest rate method not classified in the category "At fair value through profit or loss"	4,033	3,823
Interest income from impaired financial assets	356	367
Losses recognised directly in equity (-) / gains (+) from the measurement of financial assets	0	-15,284

14 Income taxes

	2019	2018
		€'000
Current income taxes	1,819	76
Deferred income taxes	-2,176	-653
	-357	-577

Effective income taxes relate to corporation taxes, including the solidarity surcharge, and German municipal trade taxes. The computation of income taxes at DFS is based on applicable tax regulations in connection with Section 31b(3)(3) of the German Aviation Act (LuftVG). For the other Group subsidiaries, the trade and corporation tax laws and regulations are of relevance.

Breakdown of effective income taxes		
	2019	2018
	€'000	€'000
Corporation tax	912	38
Solidarity surcharge	50	2
Municipal trade tax	857	36
Foreign taxes	0	0
	1,819	76

In addition to the tax liabilities from the current business year, possible estimated additional tax demands are also included to the extent that they might result from the current tax audit.

DFS owes taxes as the dominant enterprise for the dependent enterprise DFS Energy. Therefore, the deferred taxes of the dependent enterprise are reflected in the dominant enterprise. The spin-off of the energy plant, which is assigned to the areas relevant to air navigation charges, into DFS Energy led to a continuation of the tax measurement for this legal entity. Therefore, in determining taxes, the special situation as regards air navigation charges at DFS is also taken into consideration at DFS Energy. This does not lead to taxable temporary differences in value between the IFRS and the tax accounts.

In the Group, the tax groups are DFS, DFS International Business Services and Air Navigation Solutions. DFS International Business Services is the dominant enterprise for the dependent enterprises DFS Aviation Services, R. Eisenschmidt and Kaufbeuren ATM Training, and therefore owes the taxes. Hence, the deferred taxes of the subordinated companies are reflected in the dominant enterprise (DFS International Business Services). The sum of the results of the two groups and Air Navigation Solutions differ from the consolidated Group result as the expenses and income among the individual Group companies are eliminated in a different manner than that used for the groups for tax purposes.

Reconciliation from expected to effective income tax expense		
	2019	2018
	€'000	€'000
Net income before income taxes	35,278	-30,672
Expected tax rate (in %)	29.83	29.83
Expected income tax expense	10,520	0
Tax expense not relating to the period under review	0	0
Reduction in the tax base under Section 31b German Aviation Act (LuftVG)	-6,902	0
Deferred tax expense	-2,176	-653
Variances from consolidation	1,819	76
Effective income tax expense	-357	-577
Effective tax rate (in %)	-1.07	1.88

Deferred taxes by balance sheet item

	Deferred tax assets		Deferred tax liabilities	
	2019	2018	2019	2018
	€'000	€'000	€'000	€'000
Intangible assets	0	0	21,928	17,834
Property, plant and equipment	846	2,158	2,921	651
Financial assets	0	0	19,810	2,384
Receivables and other assets	175	382	1,672	2,028
Provisions for pensions and similar obligations	1,085,573	826,480	0	0
Other provisions	20,959	24,571	513	0
Liabilities	9,443	3,402	494	904
	1,116,996	856,993	47,338	23,801
Impact due to Section 31b LuftVG (until 2012: methodology n + 2 used)				
Intangible assets	0	0	-21,928	-17,737
Property, plant and equipment	0	-1,303	-2,646	-729
Financial assets	0	0	-19,810	-2,384
Provisions for pensions and similar obligations	-1,053,652	-804,356	0	0
Other provisions	-20,803	-19,977	-513	0
Liabilities	-4,340	-876	-179	-528
	-1,078,795	-826,512	-45,076	-21,378
Other allowances	-21,276	-14,762	0	0
Netting	-2,262	-2,423	-2,262	-2,423
Air Navigation Solutions	-14	-13	0	0
Kaufbeuren ATM Training	35	28	0	0
DFS Aviation Services	1,130	328	0	0
	15,814	13,639	0	0

The DFS Group does not recognise any deferred tax assets for tax loss carryforwards as there is no potential to offset them in the foreseeable future. In addition, there are no issues which result in deferred tax assets not being recognised.

Notes to the balance sheet

15 Goodwill

	Cost				As at 31 Dec
	As at 1 Jan	Additions	Disposals	Transfers	
2019	€'000	€'000	€'000	€'000	€'000
R. Eisenschmidt GmbH	80	0	0	0	80
	80	0	0	0	80
2018	€'000	€'000	€'000	€'000	€'000
R. Eisenschmidt GmbH	80	0	0	0	80
	80	0	0	0	80

	Amortisation				As at 31 Dec	Carrying amount As at 31 Dec
	As at 1 Jan	Additions	Disposals	Transfers		
2019	€'000	€'000	€'000	€'000	€'000	€'000
R. Eisenschmidt GmbH	0	0	0	0	0	80
	0	0	0	0	0	80
2018	€'000	€'000	€'000	€'000	€'000	€'000
R. Eisenschmidt GmbH	0	0	0	0	0	80
	0	0	0	0	0	80

The goodwill from the acquisition of R. Eisenschmidt GmbH results from the difference between the purchase price and the fair value of the net assets at the acquisition date.

The regular impairment tests of goodwill showed no indications that an impairment loss under IAS 36 had to be recognised.

Underlying assumptions for the conduct of impairment tests for goodwill

	31 Dec 2019	31 Dec 2018
R. Eisenschmidt GmbH		
Planning period	2020 to 2024 ⁶⁾	2019 to 2023 ⁷⁾
Planned revenues in €'000	4,426 to 4,526	4,826 to 7,076
Revenue growth in %	0.00 to +1.13	+5.20 to +13.47
EBT development in %	-4.12 to +7.35	+11.24 to +47.33
Investment ratio in %	0.00 to +118.55	+18.74 to +63.81

⁶⁾ From Annual Plan 2020 of the shareholder meeting on 13 August 2019

⁷⁾ From Annual Plan 2019 of the shareholder meeting on 7 August 2018

16 Intangible assets

	Cost				As at 31 Dec
	As at 1 Jan	Additions	Disposals	Transfers	
2019	€'000	€'000	€'000	€'000	€'000
Concessions, rights and licences	683,574	8,581	-760	1,720	693,115
Internally generated intangible assets	98,512	20,760	0	0	119,272
Assets under construction (AUC)	19,772	14,968	0	-1,611	33,129
	801,858	44,309	-760	109	845,516
2018	€'000	€'000	€'000	€'000	€'000
Concessions, rights and licences	671,549	10,204	-1,668	3,489	683,574
Internally generated intangible assets	80,539	17,973	0	0	98,512
Assets under construction (AUC)	18,318	4,801	0	-3,347	19,772
	770,406	32,978	-1,668	142	801,858

	Amortisation					Carrying amount As at 31 Dec
	As at 1 Jan	Additions	Disposals	Transfers	As at 31 Dec	
2019	€'000	€'000	€'000	€'000	€'000	€'000
Concessions, rights and licences	563,957	23,379	-530	3	586,809	106,306
Internally generated intangible assets	46,219	6,189	0	0	52,408	66,864
Assets under construction (AUC)	0	0	0	0	0	33,129
	610,176	29,568	-530	3	639,217	206,299
2018	€'000	€'000	€'000	€'000	€'000	€'000
Concessions, rights and licences	521,431	43,054	-528	0	563,957	119,617
Internally generated intangible assets	41,695	4,524	0	0	46,219	52,293
Assets under construction (AUC)	0	0	0	0	0	19,772
	563,126	47,578	-528	0	610,176	191,682

The regular impairment tests of intangible assets showed no indications that an impairment loss under IAS 36 had to be recognised.

Intangible assets for which there is a contractual obligation to accept but which do not yet come under the economic power of disposition of the DFS Group are shown in Note 40.2.

The DFS Group has not assigned any intangible assets nor pledged them as collateral. It freely controls these assets.

Individually material intangible assets

	Carrying amount	Remaining useful life	Share of total carrying amount
31 Dec 2019	€'000	in years	in percent
iCAS software	79,923	5 - 7	38.74
P1/ATCAS software including release	26,870	5	13.02
PSS software	2,916	1 - 5	1.41
Realisation of iCWP	2,671	6	1.29
Remote tower control	1,877	7	0.91
Total carrying amount	206,299		100.00

Capitalisation of borrowing costs for intangible assets

	31 Dec 2019	31 Dec 2018
Borrowing costs in €'000	1,291	1,104
Capitalisation rate in %	2.67	2.81

17 Property, plant and equipment

	Cost					As at 31 Dec
	As at 1 Jan	Additions	Disposals	Transfers	Currency differences	
	€'000	€'000	€'000	€'000	€'000	€'000
2019						
Land and buildings	673,968	20,590	-7,895	12,284	0	698,947
Technical equipment (plant) and machinery	1,060,397	41,391	-35,319	6,884	0	1,073,353
Operating and office equipment	85,942	5,686	-3,759	9	0	87,878
Assets under construction (AUC)	23,228	8,397	0	-19,286	0	12,339
	1,843,535	76,064	-46,973	-109	0	1,872,517
2018						
Land and buildings	673,916	2,268	-2,512	296	0	673,968
Technical equipment (plant) and machinery	1,049,652	40,036	-36,810	7,519	0	1,060,397
Operating and office equipment	83,964	4,585	-2,712	105	0	85,942
Assets under construction (AUC)	14,196	17,094	0	-8,062	0	23,228
	1,821,728	63,983	-42,034	-142	0	1,843,535

	Depreciation					Carrying amount	
	As at 1 Jan	Additions	Disposals	Transfers	Currency differences	As at 31 Dec	As at 31 Dec
2019	€'000	€'000	€'000	€'000	€'000	€'000	€'000
Land and buildings	427,906	18,190	-7,607	0	0	438,489	260,458
Technical equipment (plant) and machinery	849,365	50,541	-33,875	-2	5	866,034	207,319
Operating and office equipment	66,406	5,808	-3,547	-1	14	68,680	19,198
Assets under construction (AUC)	0	0	0	0	0	0	12,339
	1,343,677	74,539	-45,029	-3	19	1,373,203	499,314
2018	€'000	€'000	€'000	€'000	€'000	€'000	€'000
Land and buildings	412,985	17,185	-2,264	0	0	427,906	246,062
Technical equipment (plant) and machinery	837,759	47,132	-35,525	0	-1	849,365	211,032
Operating and office equipment	63,768	5,302	-2,661	0	-3	66,406	19,536
Assets under construction (AUC)	0	0	0	0	0	0	23,228
	1,314,512	69,619	-40,450	0	-4	1,343,677	499,858

Capitalisation of borrowing costs for property, plant and equipment

	31 Dec 2019	31 Dec 2018
Borrowing costs in €'000	397	375
Capitalisation rate in %	2.67	2.81

Research and development costs

	31 Dec 2019	31 Dec 2018
	€'000	€'000
Expenses for research and development	51,739	55,235
- of which research costs recognised in the income statement	31,546	37,819
- of which capitalised additions in assets under construction	20,193	17,416
Total capitalised borrowing costs on development costs as at 31 Dec	568	557
Development costs in assets under construction as at 31 December	31,257	11,421
Scheduled depreciation of development costs based on the degree of completion notified	6,189	4,524
R&D project funding by the European Commission and German Federal and regional ministries deducted from cost	0	0

Property, plant and equipment for which there is a contractual obligation to accept but which do not yet come under the economic power of disposition of the Group are shown in Note 40.2.

The DFS Group has not assigned any property, plant and equipment nor pledged them as collateral. It freely controls these assets.

The regular impairment tests of property, plant and equipment showed no indications that an impairment loss under IAS 36 had to be recognised.

Compensation of €36 thousand (previous year: €36 thousand) for third parties for property, plant and equipment that was impaired, irrecoverably lost or decommissioned was recognised in the income statement.

18 Leases

The leases entered into by the DFS Group as lessee only have a supporting function for business operations. They mainly relate to the rental of land, office space and vehicles for selected employees.

Disclosures on rights of use			
	Cost	Depreciation	Total
31 Dec 2019	€'000	€'000	€'000
Buildings	13,336	1,914	11,422
Vehicles	236	155	81
	13,572	2,069	11,503

Disclosures on lease liabilities		2019
		€'000
Lease liabilities as at 1 Jan 2019		25,305
Increase due to index adjustments		225
Principal repayments		-2,645
Interest expense		168
Lease liabilities as at 1 Dec 2019		23,053

Aged list of lease liabilities				
	Up to 1 year	2 to 5 years	More than 5 years	Total
31 Dec 2019	€'000	€'000	€'000	€'000
Undiscounted lease liabilities	2,682	6,694	15,517	24,893
Discounted lease liabilities	2,522	6,142	14,389	23,053
Interest component	160	552	1,128	1,840

Aged list of expected payments for short-term leases and leases on low value assets				
	Up to 1 year	2 to 5 years	More than 5 years	Total
31 Dec 2019	€'000	€'000	€'000	€'000
Non-discounted lease payments	1,584	1,476	1,310	4,370

Amounts for leases recognised in the statement of comprehensive income		2019
		€'000
Depreciation		2,069
Interest expense		168
Expense for short-term leases		445
Expenses for leases on low value assets		2,008

Total cash outflows for leases recognised in the cash flow statement		2019
		€'000
Payments for short-term leases and leases on low value assets		2,453
Taking on lease liabilities		25,530
Principal repayment of lease liabilities		2,645
Interest expense		168

The DFS Group also acts as lessor. In this context, it leases air traffic control systems, areas and land and provides connections and air navigation services data. The Group classified the property with a heritable building right (*Erbbaurechtsgrundstück*) in Braunschweig as "Investment property". Additional information can be found in Note 19.

In the case of all other lettings, provisions or transfers of use, essentially all risks and rewards associated with the economic ownership remain with the DFS Group. Options were not transferred to the respective lessees. The Group classified these leases as operating leases and recognised the corresponding income in the income statement.

Amounts for operating leases recognised in the statement of comprehensive income		2019
		€'000
Leasing income from operating leases		5,517

Breakdown between owned and leased property, plant and equipment for operating leases

	Buildings
31 Dec 2019	€'000
Owned property, plant and equipment	260,458
Leased property, plant and equipment (property with a heritable building right - <i>Erbbaurechtsgrundstück</i>) in Berlin	0
	260,458

19 Investment property

	Cost				As at 31 Dec €'000
	As at 1 Jan €'000	Additions €'000	Disposals €'000	Transfers €'000	
	2019 Property in Braunschweig	1,210	0	0	
2018 Property in Braunschweig	1,210	0	0	0	1,210

	Depreciation					Carrying amount As at 31 Dec €'000
	As at 1 Jan €'000	Additions €'000	Disposals €'000	Transfers €'000	As at 31 Dec €'000	
	2019 Property in Braunschweig	518	30	0	0	
2018 Property in Braunschweig	488	30	0	0	518	692

The DFS Group rents a building, including the land, in Braunschweig, Germany, to FCS Flight Calibration Services, which uses this land for its own operational purposes.

The DFS Group is not contractually obliged to conduct repairs, maintenance or improvements. However, it is authorised to make material changes to the premises and the rental object as well as necessary repairs and maintenance without the approval of FCS Flight Calibration Services. There are no other contractual obligations or restraints on disposition.

Expenses and income recognised in the statement of comprehensive income

	2019	2018
	€'000	€'000
Rental income	123	126
Depreciation	30	30
Repairs	0	0

The property is depreciated over the useful life of 40 years using the straight-line method. A review of the current rent and land reference values showed an increase of around 20.00 percent since 2017. There were no indications of a need to impair as required by IAS 36. In the opinion of the DFS Group, the results of the appraisal dated 10 October 2017 are still usable and demonstrate the recoverability of the carrying amounts.

Appraisal on the value of the property

Date of appraisal	10 October 2017	3 December 2012
Date to which appraisal applies	1 October 2017	1 December 2012
Procedure	DCF method	DCF method
Market value / fair value	€815 thousand	€980 thousand
Property yield (<i>Liegenschaftszinssatz</i>) of the city of Braunschweig	5.60%	7.60%
Initial discount rate	7.50%	8.25%

The fair value of investment property is determined by an external independent property valuer who possesses the relevant professional qualification and up-to-date experience with the location and type of property to be valued.

Valuation technique

Discounted cash flow (DCF) method: The calculation of the fair value is based on current rental rates considering various factors such as the standard land values, property yield, other operating expenses, risk of default on rents, remaining useful life of the building, maintenance risk as well as current property developments.

Unobservable inputs

Discount rate, risk of default on rents, other operating expenses

Level

3

Relationship between inputs and fair value

The estimated fair value would increase if

- the risk-adjusted discount rate was lower
 - the risk of default on rents was lower
 - other operating costs were lower
-

20 Financial assets

	Cost				As at 31 Dec
	As at 1 Jan	Additions	Disposals	Remea- surement	
2019	€'000	€'000	€'000	€'000	€'000
Financial assets accounted for using the equity method	14,359	79	0	0	14,438
Investments	2,717	0	-57	0	2,660
Loans to associated companies	7,869	0	-531	0	7,338
	24,945	79	-588	0	24,436
2018	€'000	€'000	€'000	€'000	€'000
Financial assets accounted for using the equity method	1,348	13,011	0	0	14,359
Investments	2,773	0	-56	0	2,717
Loans to associated companies	2,760	5,560	-451	0	7,869
Derivative financial instruments	2,306	0	-2,306	0	0
	9,187	18,571	-2,813	0	24,945

	Impairments					Carrying amount As at 31 Dec
	As at 1 Jan	Additions	Disposals	Transfers	As at 31 Dec	
2019	€'000	€'000	€'000	€'000	€'000	€'000
Financial assets accounted for using the equity method	0	0	0	0	0	14,438
Investments	0	0	0	0	0	2,660
Loans to associated companies	0	0	0	0	0	7,338
	0	0	0	0	0	24,436
2018	€'000	€'000	€'000	€'000	€'000	€'000
Financial assets accounted for using the equity method	0	0	0	0	0	14,359
Investments	0	0	0	0	0	2,717
Loans to associated companies	0	0	0	0	0	7,869
Derivative financial instruments	0	0	0	0	0	0
	0	0	0	0	0	24,945

There were no indications of a need to impair as required by IAS 36.

Associated companies accounted for using the equity method		
	31 Dec 2019	31 Dec 2018
	€'000	€'000
As at 1 Jan	14,359	1,348
Additions	79	13,011
Proportionate net income	0	0
Dividends received	0	0
As at 31 Dec	14,438	14,359

The Group holds 30.00 percent of the shares in FREQUENTIS DFS AEROSENSE and 22.80 percent of the shares in Unify. In both cases, the Group assumes material influence and accounts for the shares under the equity method (further disclosures in Note 3.3).

Investments					
	GroupEAD	BILSODA	ESSP SAS	TATS	Total
	€'000	€'000	€'000	€'000	€'000
Shareholding in %	36.00	24.90	16.67	50.00	
Share capital	360	0	167	500	1,027
Liabile capital (<i>Haft einlagen</i>)	0	2	0	0	2
Other contributions	0	1,631	0	0	1,688
As at 31 Dec 2019	360	1,633	167	500	2,660

Loans to associated companies					
	Term	Nominal value	Nominal interest rate	31 Dec 2019	31 Dec 2018
		€'000	in %	€'000	€'000
FCS					
Loan: Flight instrument system	2009 - 2019	900	5.25	0	58
Loan: Hawker Beechcraft Super King Air FL-626 D-CFME	2009 - 2025	4,300	5.25	1,976	2,251
Loan: Hawker Beechcraft Super King Air FL-1156	2018 - 2033	5,560	2.10	5,362	5,560
		10,760		7,338	7,869

21 Trade receivables

Due dates of trade receivables				
	Up to 1 year	2 to 5 years	More than 5 years	Total
	€'000	€'000	€'000	€'000
2019	152,194	51	0	152,245
2018	157,741	0	0	157,741

Aged list		
	31 Dec 2019	31 Dec 2018
	€'000	€'000
Carrying amount	152,245	157,741
of which not impaired and		
- not yet overdue	142,319	149,423
- up to 30 days overdue	4,753	4,458
- 31 to 60 days overdue	2,554	2,382
- 61 to 180 days overdue	1,911	839
- more than 180 days overdue	708	639
of which impaired	0	0

Trade receivables were written down to the amount that could be recovered as soon as information on the insolvency of customers was available. There are no indications that the debtors whose receivables were overdue will not be able to fulfil their obligations.

Development of allowances		
	31 Dec 2019	31 Dec 2018
	€'000	€'000
As at 1 Jan	10,393	11,553
Additions	5,007	1,053
Utilisation	0	0
Reversal	-1,479	-2,213
As at 31 Dec	13,921	10,393

Expenses (-) and income (+) recognised in the statement of comprehensive income		
	2019	2018
	€'000	€'000
Derecognition and write-off of receivables	-1,424	-2,121
Income from payment of receivables previously written off	62	7
Income from other derecognitions	79	20
Additions to specific allowances	-5,007	-1,053
Income from reversal of specific allowances	1,479	2,213

At the balance sheet date, there were no trade receivables in foreign currencies (previous year: none).

The DFS Group did not pledge any receivables as securities for loans.

22 Contractual net values

Contract assets	31 Dec 2019	31 Dec 2019	31 Dec 2018	31 Dec 2018
	Total	Remaining term more than 1 year	Total	Remaining term more than 1 year
	€'000	€'000	€'000	€'000
Consulting services and service contracts	1,784	0	4,485	0
Software developments	78	0	1,497	0
Miscellaneous	569	0	1,163	0
	2,431	0	7,146	0

Revenues and costs from contracts with customers		
	2019	2018
	€'000	€'000
Contract revenue recognised	9,034	7,533
Depreciation, amortisation and impairments	57	0
Costs incurred	6,967	7,186
Capitalised costs	0	0
Profit earned for ongoing projects	2,010	347

Development of contract liabilities			
	2019	2018	
	€'000	€'000	
As at 1 Jan	1,408	2,972	
Additions	21,679	2,708	
Revenues recognised in the business year that were included under contract liabilities at the beginning of the period	-1,037	-1,834	
Revenues recognised in the business year that were not included under contract liabilities at the beginning of the period	-19,729	-2,438	
Contract liabilities	2,321	1,408	

Contract liabilities result from security deposits of airspace users for air navigation services and customer payments for air traffic control systems and further services.

23 Other receivables and assets

	31 Dec 2019	31 Dec 2019	31 Dec 2018	31 Dec 2018
	Total	Remaining term more than 1 year	Total	Remaining term more than 1 year
	€'000	€'000	€'000	€'000
QTE transaction	29,371	21,834	36,004	28,817
Capitalised value	5,675	5,675	3,856	3,856
Receivables from EU grant funding	49,011	49,011	42,564	42,564
Interest receivables	1,274	0	1,341	0
Receivables from investments	55	0	72	0
Trusteeship (<i>Treuhandverein</i>)	14,531	50	6,168	50
Creditors with debit balances	0	0	0	0
Remaining	1,922	0	1,451	5
Other receivables and assets (financial)	101,839	76,570	91,456	75,292
Remaining other receivables and assets (non-financial)	7,173	0	6,838	0
Prepayments	279	0	132	0
	109,291	76,570	98,426	75,292

Aged list	31 Dec 2019	31 Dec 2018
	€'000	€'000
Carrying amount	109,291	98,426
of which not impaired and		
- not yet overdue	109,291	98,426
- up to 30 days overdue	0	0
- 31 to 60 days overdue	0	0
- 61 to 180 days overdue	0	0
- more than 180 days overdue	0	0
of which impaired	0	0

No receivables served as securities for loans or as collateral for other liabilities.

The qualified technological equipment (QTE) transaction with foreign investors was basically terminated in 2012. The DFS Group agreed with the remaining contracting parties to keep up the domestic cash flows. The restructuring of the contractual relationships allowed financial drawbacks to be avoided. The remaining purely inner-German shell structure comprises a claim against NORD/LB and a liability against KfW Kreditanstalt für Wiederaufbau (see Note 30). The new loan contracts concluded have fixed interest and principal payments and a term until 2 January 2022. The Group receives the claims from the ongoing rent from NORD/LB without having to provide a consideration. The Group bears the default risk of NORD/LB during the term. For the liability, temporally limited collateral was pledged to KfW in the form of the assignment of the receivables against NORD/LB. This hedge was dissolved in 2013 after a one-off payment. The termination of the QTE transaction led to a significant improvement in the risk position for the creditors of the DFS Group.

24 Inventories

	31 Dec 2019	31 Dec 2018
	€'000	€'000
Goods in stock	5,492	4,986
Emission rights	704	281
	6,196	5,267

Expenses and income recognised in the statement of comprehensive income

	2019	2018
	€'000	€'000
Raw materials and consumables used	2,887	2,602
Cost of purchased products	1,551	1,398
Impairment of raw materials and consumables used	4	31
Impairment of finished goods and goods for resale	0	0

25 Financial assets

	31 Dec 2019	31 Dec 2018
	€'000	€'000
Securities (at fair value through profit or loss)	755,607	676,262
Derivatives (at fair value through profit or loss)	3,341	904
	758,948	677,166

The DFS Group invested in a fund (legal name: ATCP-UI-FONDS) through an investment entity. Management decided to hold the financial assets for trading to actively realise cash flows from the purchase and sale of assets. The capital investments relate primarily to securities, which the Group measured at fair value through profit or loss. There are active markets with published market prices. The capital investments made were distributed in the consolidated financial statements over the corresponding financial assets and liabilities.

In November 2019, the part of the fund assets that had qualified as plan assets and had been transferred to the DFS Treuhandverein (trusteeship) was transferred to a fund (PEGASUS-UI-FONDS) (see Note 28.7). Since then, DFS has been the sole shareholder in this fund (ATCP-UI-FONDS).

The Group's overall investment goal is to reduce the risk of loss on a yearly basis compared with the strategic asset allocation while earning a return consistent with the allocation over the market cycle. The DFS Group expects an annual return on the whole portfolio of 1.00 percent on average over the investment horizon of three to five years.

The DFS Group defined asset allocation bands for the minimum and maximum exposure for each asset class: cash, government bonds, corporate bonds and equities.

The Group also classified various risk categories:

- Market risk (beta risk) is defined as the loss in value from the change in value of the asset class.
- Hedge error is defined as the loss resulting if the assigned benchmark cannot be replicated exactly in the asset class.
- Tracking error is the risk that there might be a divergence between the behaviour of the underlying portfolio and the behaviour of the benchmark.

The risk manager reviews these risks constantly. The exposures are adjusted at least once a month as needed and managed using derivatives, futures or options.

26 Liquid funds

	31 Dec 2019	31 Dec 2018
	€'000	€'000
Cash in hand and cheques	31	35
Cash at bank	366,567	455,054
	366,598	455,089

27 Equity

	31 Dec 2019	31 Dec 2018
	€'000	€'000
Subscribed capital	755,288	755,288
Capital reserve	74,296	74,296
Remeasurement reserves	-2,345,964	-1,552,537
Retained earnings	93,081	57,446
Share of equity attributable to Shareholder of parent company	-1,423,299	-665,507
Minority interest	4,052	0
	-1,419,247	-665,507

The registered capital of the DFS Group amounts to €755,287,500.00 (seven hundred and fifty-five million two hundred and eighty-seven thousand five hundred euro). There are 7,552,875 shares with a nominal value of €100.00 each held by the sole Shareholder, the Federal Republic of Germany, represented by the Federal Ministry of Transport and Digital Infrastructure (BMVI). The shares may not be sold or encumbered. Additional shareholders may not be admitted.

The capital reserves consist of other payments of the Shareholder (Section 272(2)(4) German Commercial Code, HGB) and serve to strengthen the share capital.

Other reserves are used for changes recognised directly in equity that are not based on capital transactions with the Shareholder.

The Shareholder approved the consolidated financial statements, the Group management report and the financial statements as at 31 December 2018 under the German Commercial Code (HGB) in resolution number 166 dated 23 April 2019 and decided to carry forward the net loss 2018 under HGB:

Uses of net income as at	31 Dec 2018	31 Dec 2017
	€'000	€'000
Net loss (-) / profit (+)	-481,135	-132,901
Gross dividend to the Shareholder	0	0
Carryforward	-481,135	-132,901

Other comprehensive income after taxes contained in the reserves

	Remeasurement reserves	Other reserves	Other comprehensive income
31 Dec 2019	€'000	€'000	€'000
Remeasurement of the net defined benefit liability	-793,522	0	-793,522
Changes in the fair value of debt instruments at fair value through other comprehensive income	0	0	0
Currency differences from the conversion of foreign operations or investments	95	0	95
	-793,427	0	-793,427
31 Dec 2018	€'000	€'000	€'000
Remeasurement of the net defined benefit liability	-171,042	0	-171,042
Changes in the fair value of debt instruments at fair value through other comprehensive income	-15,284	0	-15,284
Currency differences from the conversion of foreign operations or investments	7,362	0	7,362
	-178,964	0	-178,964

28 Provisions for pensions and similar obligations

Provisions for pensions are recognised exclusively for defined benefit plans for active and former employees.

The level of detail presented in the numbers reported in the following sections is based on the collective agreements and individual contracts relevant to the DFS Group:

Acronym	Contents
VersTV (Pensions) ⁸⁾	This collective agreement relates to the pensions for the staff employed at the DFS Group.
ÜVersTV (Transitional payments)	This collective agreement relates to the transitional payments for air traffic controllers and flight data assistants employed at the DFS Group.
KTV (Insurance)	This collective agreement covers the health and long-term care insurance for the staff employed at the DFS Group.
Miscellaneous	The accessory obligations for death grants and the deferred compensation scheme for pensions (old) are grouped under "Miscellaneous".

⁸⁾ In Note 28.6, the defined benefit obligations under the VersTV are further split between final salary benefits and benefits linked to average career earnings.

28.1 Pension plans

There are various forms of pension provision available to the employees of the DFS Group, which are largely governed by collective agreements.

Under the collective agreement covering pensions (VersTV), employees who began employment at the company by 31 December 2004 receive old-age, disability and surviving dependant's benefits (defined benefit plans) linked to the respective final salary of the employee (Plan A). However, employees who entered service from 1 January 2005 receive benefits under the collective agreement covering pensions which are linked to average career earnings (Plan B). Under this system, a pension component is calculated each year based on the respective income and the old-age pension is determined based on the sum of the annual pension components.

Air traffic controllers and flight data assistants receive a transitional retirement benefit linked to their final salary (ÜVersTV). This is to cover the period from the end of their operational activity until the earliest possible receipt of the statutory pension.

Both plans (VersTV and ÜVersTV) are financed by reinsurance policies that are recognised as plan assets within the meaning of IAS 19.8. The reinsurance contract requires an investment in line with the investment guidelines under the general cover fund of the insurer and a separate fund-based investment created for part of the assets. The latter, however, is limited to a maximum of half of the actuarial reserve.

DFS pays an increased employer contribution for health insurance for the employees who were previously employed as established civil servants with the former Federal Administration of Air Navigation Services (BFS) and the Federal Aviation Office (LBA). This compensates over the entire active period of employment and in retirement for the fact that these staff are no longer covered by the German civil service welfare provisions for healthcare.

The DFS Group pays death grants to qualifying next of kin of active employees. The grants are equal to the previous remuneration and are paid for two and half months from the month following the month in which the employee passed away.

In addition, there are individual contractual benefits approved in 2005 which are based on the salary conversion model for exempt employees. The amount of the pension capital underlying the benefit is based on the converted salary with a return of 6.00 percent.

In addition to defined benefit benefits, the DFS Group also grants defined contribution benefits.

There were no changes, curtailments or settlements to the pension plans in the business year.

28.2 Actuarial assumptions

In %	31 Dec 2019	31 Dec 2018
Discount rate	1.10	1.80
Projected return on plan assets	1.10	1.80
Salary trend	2.50	2.50
Projected increase in benefits ⁹⁾	1.25-2.50	1.00-4.00

⁹⁾ 1.25 percent for the guaranteed adjustment for staff with benefits under VersTV 2009
2.00 percent for staff with benefits under VersTV 1993 (static reference)

28.3 Sensitivity analysis

The sensitivity analysis takes into account the respective change of one individual assumption compared to the reference value, which is made up of the sum of the individual present values of the pension obligations from the VersTV (Pensions), ÜVersTV (Transitional payments) and KTV (Insurance). The remaining parameters of the original calculations remain unchanged. This ensures that potential correlation effects are excluded.

		Impact on the defined benefit obligations	
		€'000	In %
Present value of defined benefit obligations at 31 Dec 2019		5,891,321	
Discount rate	Increase by 0.5 percentage points	-606,327	-10.29
	Decrease by 0.5 percentage points	717,772	12.18
Salary trend	Increase by 0.5 percentage points	257,953	4.38
	Decrease by 0.5 percentage points	-238,306	-4.05
Present value of defined benefit obligations at 31 Dec 2018		4,824,659	
Discount rate	Increase by 0.5 percentage points	-466,342	-9.67
	Decrease by 0.5 percentage points	547,183	11.34
Salary trend	Increase by 0.5 percentage points	214,936	4.45
	Decrease by 0.5 percentage points	-198,327	-4.11

The VersTV dated 21 August 2009 sets out a fixed annual adjustment of 1.25 percent. This means there is no sensitivity calculation for the pension progression.

For a specific group of people, the adjustment logic is set out in the VersTV 2005. This collective agreement has an adjustment of 2.00 percent per year as well as a lagging correction for inflation that follows a three-year rhythm. As this represents an immaterial portion of the overall obligation, the DFS Group does not conduct a sensitivity calculation for the pension progression.

28.4 Risks

The pension obligations and the plan assets are subject to fluctuations over time. The reasons for these fluctuations and the associated risks arise from the usual actuarial risks and the financial risks in connection with the plan assets.

28.4.1 Demographic risks

As a large part of the defined benefit obligations are paid for the whole life and also include survivor's pensions, earlier entitlement and longer periods of benefit payment can lead to higher pension obligations, expenses and higher retirement benefits than expected.

28.4.2 Market price risks

The amount of the net obligation from occupational pensions is exposed to interest rate risk and is particularly influenced by the discount rate. The rate is determined by reference to market yields at the reporting date on high-quality fixed-rate corporate and treasury bonds. The current low level of interest rates has resulted in a comparatively high obligation. Potential fluctuations in the pension obligations are considered when managing the plan assets. However, the rise in the pension obligations can only be partly offset by the rise in the market values of plan assets. The low interest rate level means that substantial returns cannot be earned, which reduces the speed at which the assets for occupational pensions may grow.

The investment form chosen by DFS Aviation Services offers a balanced mix of risk and return. The insurance contracts offer a guaranteed rate of 2.25 percent for old contracts and 0.90 percent for new contracts, including the grant of a terminal bonus.

28.4.3 Liquidity risks

The daily liquidity of the DFS Group is monitored by the Treasury department and is managed with the help of short-term (< year) and medium-term liquidity plans.

28.4.4 Inflation risks

The Group distinguishes in its pension plans between benefits that are based on the respective final salary of the employee and benefits based on the career average plan. With the latter, the pension component is directly tied to the respective income. A rise in salaries tied to inflation would therefore lead to a rise in the pension obligations.

28.5 Duration and expected pension and contribution payments

The DFS Group has concluded reinsurance policies with an insurance consortium consisting of four life insurance companies to secure its obligations from the collective agreement on pensions and transitional payments. This ensures that the benefits payable can actually be paid when the insured event arises. The capital investment of the consortium is made under the provisions of the German Insurance Supervision Act (VAG), which requires a separate investment in a fund-based pension insurance policy. All the consortium members to the group insurance policy are also members of the guarantee fund of the Protektor Lebensversicherungs-Aktiengesellschaft, ensuring that the interests of the insured are protected in the event of an insolvency of one of the companies (additional information can be found at www.protektor-ag.de).

Expected due date of undiscounted payments	Up to 1 year	2 to 5 years	6 to 15 years
	€'000	€'000	€'000
Estimated pension payments ¹⁰⁾	123,429	566,734	1,754,062
- of which reinsured with the insurance consortium	114,395	529,424	1,671,155
Expected employer contributions to plan assets	288,637	983,828	2,065,942

¹⁰⁾ From the H²B detailed forecast 2019 to 2034 dated 27 May 2019

The weighted duration of the pension obligations amounts to 22.6 years (previous year: 21.3 years) as at 31 December 2019.

28.6 Defined benefit obligations

	VersTV (Pensions)	ÜVersTV (Transitional payments)	KTV (Insurance)	Other	Total
31 Dec 2019	€'000			€'000	€'000
As at 1 Jan 2019	3,449,221	1,167,502	208,291	4,882	4,829,896
Current service cost	116,302	54,512	1,560	102	172,476
Interest expense	61,573	20,601	3,678	85	85,937
Retirement benefits paid	-55,062	-46,030	-7,725	-290	-109,107
Acquisitions/disposals of businesses	0	1,527	0	0	1,527
Actuarial gains (-) and losses (+)	746,964	193,846	-24,996	388	916,202
- of which changed parameters	688,619	118,294	-17,517	237	789,633
- of which experience-based adjustments	58,345	75,552	-7,479	151	126,569
Present value of defined benefit obligations	4,318,998	1,391,958	180,808	5,167	5,896,931
- of which benefits based on final salary					
Retirement payments	3,550,613				
One-time payments	59,940				
- of which benefits based on career average plan					
Retirement payments	708,445				
One-time payments	0				
	VersTV (Pensions)	ÜVersTV (Transitional payments)	KTV (Insurance)	Other	Total
31 Dec 2018	€'000	€'000	€'000	€'000	€'000
As at 1 Jan 2018	3,263,720	1,122,068	215,702	5,279	4,606,769
Current service cost	112,360	54,222	1,903	110	168,595
Interest expense	58,270	19,830	3,814	89	82,003
Retirement benefits paid	-50,739	-42,239	-7,797	-545	-101,320
Acquisitions/disposals of businesses	0	451	0	0	451
Actuarial gains (-) and losses (+)	65,610	13,170	-5,331	-51	73,398
- of which changed parameters	0	-29	0	0	-29
- of which changed biometric basis	48,886	-7,451	5,553	-119	46,869
- of which experience-based adjustments	16,724	20,650	-10,884	68	26,558
Present value of defined benefit obligations	3,449,221	1,167,502	208,291	4,882	4,829,896
- of which benefits based on final salary					
Retirement payments	2,960,161				
One-time payments	37,810				
- of which benefits based on career average plan					
Retirement payments	451,250				
One-time payments	0				

28.7 Plan assets

					Total
					€'000
31 Dec 2019					
As at 1 Jan 2019					2,813,296
Projected return on plan assets					51,776
Employer contributions and payments					239,170
Retirement benefits paid					-81,747
Actuarial gains (+) and losses (-)					122,680
Market values of plan assets					3,145,175
Actual return on plan assets					174,456
	Fund assets	VersTV (Pensions)	ÜVersTV (Transitional payments)	KTV (Insurance)	Total
	€'000	€'000	€'000	€'000	€'000
31 Dec 2018					
As at 1 Jan 2018	0	1,767,778	635,143	20,053	2,422,974
Projected return on plan assets	0	33,594	12,415	353	46,362
Employer contributions and payments	0	83,533	45,959	0	129,492
Retirement benefits paid	0	-43,449	-30,293	-845	-74,587
Actuarial gains (+) and losses (-)	0	-104,921	7,715	-438	-97,644
Additions	386,699	0	0	0	386,699
Market values of plan assets	386,699	1,736,535	670,939	19,123	2,813,296
Actual return on plan assets	0	-71,327	20,130	-85	-51,282

The DFS Group decided to adjust the financing of pension obligations in the business year 2018. It is gradually phasing out the current insurance-based reinsurance and will in future only refinance itself by means of a fund solution. To this end, the Group transferred the fund (PEGASUS-UI-FONDS) from the insurance consortium to the Treuhandverein (trusteeship) and cancelled the risk insurance policies. In addition, the Group transferred the portion of the fund (ATCP-UI-FONDS) assigned for these purposes to the PEGASUS-UI-FONDS. In the future, the DFS Group will cover claims from the existing reinsurance policies and funds. It is therefore not possible to allocate the plan assets to the individual pension plans.

Due to the measures described above, a clear allocation of the funds is now possible. PEGASUS-UI-FUND serves to finance the pension obligations, while ATCP-UI-FUND is available to the Group as a non-current asset.

Composition of plan assets	31 Dec 2019	31 Dec 2018
	€'000	€'000
Capital investment in the general cover fund of the insurer (KTV)	1,451,771	1,569,029
Capital investment in PEGASUS-UI-FONDS	1,693,404	857,568
Capital investment in ATCP-UI-FONDS	0	386,699
Market value of plan assets	3,145,175	2,813,296

28.8 Remeasurement of the net defined benefit liability in equity

	Fund assets	VersTV (Pensions)	ÜVersTV (Transitional payments)	KTV (Insurance)	Other	Total
31 Dec 2019	€'000	€'000	€'000	€'000	€'000	€'000
As at 1 Jan 2019	0	-1,192,935	-275,832	-90,233	-1,189	-1,560,189
Remeasurement of the net liability in equity = actuarial gains (+) and losses (-) of the ongoing business year	123,098	-746,964	-193,846	24,578	-388	-793,522
Remeasurement of the net defined benefit liability in equity	123,098	-1,939,899	-469,678	-65,655	-1,577	-2,353,711

	VersTV (Pensions)	ÜVersTV (Transitional payments)	KTV (Insurance)	Other	Total
31 Dec 2018	€'000	€'000	€'000	€'000	€'000
As at 1 Jan 2018	-1,022,404	-270,377	-95,126	-1,240	-1,389,147
Remeasurement of the net liability in equity = actuarial gains (+) and losses (-) of the ongoing business year	-170,531	-5,455	4,893	51	-171,042
Remeasurement of the net defined benefit liability in equity	-1,192,935	-275,832	-90,233	-1,189	-1,560,189

28.9 Net defined benefit liability

	Fund assets	VersTV (Pensions)	ÜVersTV (Transitional payments)	KTV (Insurance)	Other	Total
31 Dec 2019	€'000	€'000	€'000	€'000	€'000	€'000
As at 1 Jan 2019	-2,794,173	3,449,221	1,167,502	189,168	4,882	2,016,600
Expenses in income statement	-51,439	177,875	75,113	4,901	187	206,637
Retirement benefits paid	80,891	-55,062	-46,030	-6,869	-290	-27,360
Employer contributions	-239,170	0	0	0	0	-239,170
Remeasurement of the net liability in equity = actuarial gains (-) and losses (+) of the ongoing business year	-123,098	746,964	193,846	-24,578	388	793,522
Transfers/reconciliation	0	0	1,527	0	0	1,527
Net defined benefit liability (+)	-3,126,989	4,318,998	1,391,958	162,622	5,167	2,751,756
31 Dec 2018	€'000	€'000	€'000	€'000	€'000	€'000
As at 1 Jan 2018	0	1,495,942	486,925	195,649	5,279	2,183,795
Expenses in income statement	0	137,036	61,637	5,364	199	204,236
Retirement benefits paid	0	-7,290	-11,946	-6,952	-545	-26,733
Employer contributions	0	-83,533	-45,959	0	0	-129,492
Remeasurement of the net liability in equity = actuarial gains (-) and losses (+) of the ongoing business year	0	170,531	5,455	-4,893	-51	171,042
Transfers/reconciliation	0	0	451	0	0	451
Additions	-386,699	0	0	0	0	-386,699
Net defined benefit liability (+)	-386,699	1,712,686	496,563	189,168	4,882	2,016,600

28.10 Balance sheet amounts

	Fund assets	VerSTV (Pensions)	ÜVerSTV (Transitional payments)	KTV (Insurance)	Other	Total
31 Dec 2019	€'000	€'000	€'000	€'000	€'000	€'000
Present value of defined benefit obligations	0	4,318,998	1,391,958	180,808	5,167	5,896,931
Fair value of plan assets	3,126,989	0	0	18,186	0	3,145,175
Funding status obligation (+) and asset (-)	-3,126,989	4,318,998	1,391,958	162,622	5,167	2,751,756
Amount not recognised as assets	0	0	0	0	0	0
Net amount of debt items (+) and asset items (-) in the balance sheet	-3,126,989	4,318,998	1,391,958	162,622	5,167	2,751,756
31 Dec 2018	€'000	€'000	€'000	€'000	€'000	€'000
Present value of defined benefit obligations	0	3,449,221	1,167,502	208,291	4,882	4,829,896
Fair value of plan assets	386,699	1,736,535	670,939	19,123	0	2,813,296
Funding status obligation (+) and asset (-)	-386,699	1,712,686	496,563	189,168	4,882	2,016,600
Amount not recognised as assets	0	0	0	0	0	0
Net amount of debt items (+) and asset items (-) in the balance sheet	-386,699	1,712,686	496,563	189,168	4,882	2,016,600

28.11 Expenses and income recognised in the statement of comprehensive income

	Fund assets	VersTV (Pensions)	ÜVersTV (Transitional payments)	KTV (Insurance)	Other	Total
31 Dec 2019	€'000	€'000	€'000	€'000	€'000	€'000
Interest expense	0	61,573	20,601	3,678	85	85,937
Projected return on plan assets	-51,439	0	0	-337	0	-51,776
Net interest expense	-51,439	61,573	20,601	3,341	85	34,161
Current service cost	0	116,302	54,512	1,560	102	172,476
Past service cost	0	0	0	0	0	0
Expenses in income statement	-51,439	177,875	75,113	4,901	187	206,637
Reversal of the provision for past service cost						-6,065
Interest income from capitalised value						-116
Contributions to the German mutual insurance association						4,299
Payments to defined contribution plans						38,625
- of which contributions to pension insurance						35,612
						243,380
31 Dec 2018		€'000	€'000	€'000	€'000	€'000
Interest expense		58,270	19,830	3,814	89	82,003
Projected return on plan assets		-33,594	-12,415	-353	0	-46,362
Net interest expense		24,676	7,415	3,461	89	35,641
Current service cost		112,360	54,222	1,903	110	168,595
Past service cost		0	0	0	0	0
Expenses in income statement		137,036	61,637	5,364	199	204,236
Reversal of the provision for past service cost						-6,065
Interest income from capitalised value						0
Contributions to the German mutual insurance association						2,764
Payments to defined contribution plans						36,767
- of which contributions to pension insurance						34,165
						237,702

29 Other provisions

	As at 1 Jan 2019	Utilisation	Reversal	Discounting	Additions	As at 31 Dec 2019	Remaining term more than 1 year
	€'000	€'000	€'000	€'000	€'000	€'000	€'000
Over-recovery of charges	298,553	-77,361	0	0	137,352	358,544	138,547
Personnel	44,922	-7,471	0	369	22,408	60,228	50,196
Re-conversion	18,244	-297	0	787	0	18,734	18,562
Leasehold (Erbpacht)	16,729	-11,959	-6,007	1,237	0	0	0
Preserving records	10,411	-882	0	160	1,131	10,820	9,877
Miscellaneous	3,000	-1,266	-152	0	1,988	3,570	0
	391,859	-99,236	-6,159	2,553	162,879	451,896	217,182

The provision for over-recovery of charges relates to the over-recovery for the past service cost still to be allocated over four years.

For the en-route cost unit, a regulated procedure for determining charges has been in force since 2012. Across Europe, the respective national supervisory authorities lay down binding unit rates according to EU regulations. Consequently, traffic volume and cost changes impact profit and loss. If the values fall short, the DFS Group is authorised and obliged to demand any under-recovery and if the values exceed the relevant thresholds, it is authorised and obliged to return any over-recovery (carry-over). In 2015, the terminal services cost unit was shifted to a performance-based form of regulation. The charges are set by means of a statutory instrument of the Federal Government. For the en-route cost unit, the chances and risks resulting from the differences between planned and actual traffic volume are split between the airspace users and the Group.

The DFS Group participated in several bidding rounds in targeted investments in air traffic management under one of the EU funding programmes. From these grant programmes of the Connecting Europe Facility, the Group acquired grant funding to foster SESAR implementation projects over various terms until 2023. The DFS Group plans to use the grant funding to reduce air navigation services charges and includes the funding in the over-recovery of charges. Grant funding is recognised as accruals and recorded in profit or loss over the useful lives of the underlying property, plant and equipment.

Personnel provisions comprise provisions for early retirement, partial retirement, anniversary payments and recuperation cures (treatments) for air traffic controllers. Actuarial reports are available for early retirement, partial retirement and anniversary obligations.

Up until now, partial retirement obligations were recognised based on individual contractual agreements. The contributions were placed in a fiduciary account. With effect from 1 April 2017, DFS concluded a new collective agreement covering partial retirement with the air navigation services union (GdF) based on the so-called 'block model'. The work to be done over the entire period of the employment relationship under partial retirement is split in such a way that it is carried out in the first half, or block (working phase, *Beschäftigungsphase*). In the second half, or block, the employee is released from work and paid proportionally. The DFS Group recognises provisions for the release phase. Partial retirement obligations are based on a discount rate as at 1 January 2020 of 1.10 percent (previous year: 1.80 percent) and a salary trend of 2.50 percent (previous year: 2.50 percent).

Due dates of future non-discounted settlement values						
	2020	2021	2022	2023	2024	From 2025
	€'000	€'000	€'000	€'000	€'000	€'000
Over-recovery of charges	219,997	101,280	0	0	37,267	0
Personnel	10,032	7,163	4,763	2,753	972	34,545
Re-conversion	172	3,300	91	0	0	15,171
Preserving records	943	950	958	966	991	6,012
Miscellaneous	3,570	0	0	0	0	0
	234,714	112,693	5,812	3,719	39,230	55,728

Discount rates (in %) distributed over the respective remaining terms in years						
	1 to 2	2 to 3	3 to 4	4 to 5	5 to 6	6 to 7
2019	-0.35	-0.35	-0.25	-0.25	-0.15	-0.15
2018	-0.37	-0.30	-0.18	-0.04	0.11	0.25
	7 to 8	8 to 9	9 to 10	10 to 15	15 to 30	
2019	-0.03	0.01	0.10	-0.05	0.42	
2018	0.33	0.39	0.47	0.40	0.95	

Effects of the changes to the discount rate			
	Computation with the interest rate as at 31 Dec 2019	Computation with the interest rate as at 31 Dec 2018	Effects
	€'000	€'000	€'000
Discounted provisions	56,406	55,435	+971
Interest expense	947	103	+844

30 Financial liabilities

	31 Dec 2019	31 Dec 2019	31 Dec 2018	31 Dec 2018
	Total	Remaining term more than 1 year	Total	Remaining term more than 1 year
	€'000	€'000	€'000	€'000
Debenture loans	197,500	110,000	197,500	197,500
QTE transaction	29,785	22,081	36,612	29,223
Derivative financial instruments	705	0	1,965	0
Financial debt from the capital investments of the investment entity	270	0	573	0
Finance lease liabilities	23,053	20,695	0	0
	251,313	152,776	236,650	226,723

Debenture loans					
Term	Currency	Nominal value	Nominal interest rate	31 Dec 2019	31 Dec 2018
		€'000		€'000	€'000
2010 to 2020	EUR	87,500	3.007%	87,500	87,500
2013 to 2023	EUR	110,000	2.308%	110,000	110,000
		197,500		197,500	197,500

The QTE transaction with foreign investors was basically terminated. DFS agreed with the remaining contracting parties to keep up the domestic cash flows (for additional disclosures on the QTE transaction see Note 23).

31 Trade payables

	31 Dec 2019	31 Dec 2019	31 Dec 2018	31 Dec 2018
	Total	Remaining term more than 1 year	Total	Remaining term more than 1 year
	€'000	€'000	€'000	€'000
Germany	21,028	0	26,081	0
Abroad	4,064	0	3,700	0
Creditors with debit balances	184	0	0	0
Amounts withheld	757	332	1,027	570
	26,033	332	30,808	570

Trade payables in foreign currencies amount to €139 thousand (previous year: €243 thousand) on the balance sheet date. Due to the low impact on the results (approx. €1 thousand), there was no currency valuation. Trade payables are regularly secured by means of reservation of title clauses until payment is made in full.

32 Other liabilities

	31 Dec 2019	31 Dec 2019	31 Dec 2018	31 Dec 2018
	Total	Remaining term more than 1 year	Total	Remaining term more than 1 year
	€'000	€'000	€'000	€'000
Staff costs	24,258	0	27,856	0
Outstanding invoices	8,057	0	10,861	0
Interest payable	3,446	0	3,605	0
Share of en-route charges: German Meteorological Service	967	0	933	0
Amounts owed to Shareholder	9,451	0	4,815	0
Liabilities to investments	1,483	0	1,308	0
Liabilities from the capital investments of the investment entity	1,790	0	399	0
Remaining	638	0	1,023	0
Other liabilities (financial)	50,090	0	50,800	0
Staff costs	33,234	0	28,656	0
Amounts owed to tax authorities	16,648	0	14,553	0
Remaining	27,128	25,689	21,069	19,135
Other liabilities (non-financial)	77,010	25,689	64,278	19,135
	127,100	25,689	115,078	19,135

Offsetting of financial assets and liabilities			
	Financial assets (+)	Financial liabilities (-)	Assets (+) and liabilities (-) as reported on the balance sheet
31 Dec 2019	€'000	€'000	€'000
Shareholder	622	-10,073	-9,451
Associated companies			
FCS	106	-1,589	-1,483
AEROSENSE	7	0	7
Investments			
GroupEAD	77	-29	48
31 Dec 2018	€'000	€'000	€'000
Shareholder	773	-5,588	-4,815
Associated companies			
FCS	87	-1,395	-1,308
Investments			
GroupEAD	72	0	72

The fair values of the offset financial assets and liabilities correspond to their carrying amounts. The DFS Group did not receive collateral for the financial assets nor did it provide collateral for the financial liabilities.

33 Tax assets and obligations

	Tax assets		Income tax obligations	
	31 Dec 2019	31 Dec 2018	31 Dec 2019	31 Dec 2018
	€'000	€'000	€'000	€'000
Non-current				
Corporation tax	0	0	18,092	18,092
Trade tax	0	0	12,777	12,777
Foreign taxes	0	0	0	0
Current				
Corporation tax	73,624	16,363	0	0
Trade tax	6,076	9,683	0	0
Foreign taxes	46	46	100	100
Other taxes	81	43	0	0
	79,827	26,135	30,969	30,969

Non-current income tax obligations relate to provisions from the tax audit from the years 2003 to 2011.

Additional disclosures

34 Segment reporting

Segment reporting is based on the internal management and reporting systems. Commercial management and reporting have been based on cost units and contribution margins since the start of economic regulation. This enhances the transparency as well as the planning and control of the individual divisions.

Within the scope of segment reporting, the Board of Managing Directors as the chief operating decision-maker allocates company funds and assesses the performance of the operating segments. The operating result (operating EBIT) is an important performance indicator for the DFS Group. EBIT is used for resource allocation and to measure the profitability of the segments. Further data are neither collected nor communicated to the chief operating decision-makers.

Regulated business

The main business of the DFS Group (see section 1.2 in the Group management report) is the provision of air navigation services and the directly associated support activities. The DFS Group defines these activities as the 'regulated business'. This is divided into the Control Centre and Tower divisions.

Commercial business

The commercial business comprises all Group activities that are not allocated to the regulated business. The focus is on products and services offered internationally on the free market, namely air navigation services, consultancy services, the sale of air traffic control systems, as well as analysis, simulation and project management activities, and the sale of publications and energy. DFS International Business Services bundles the commercial business and ensures its successive expansion through its investments where it holds a controlling interest directly or indirectly, namely DFS Aviation Services, Air Navigation Solutions, R. Eisenschmidt and Kaufbeuren ATM Training.

The determination of segment data is based on the following premises:

- The assets and liabilities of DFS Energy are included as part of the operating assets in the cost-base for determining charges. Consequently, in the reconciliation to the Group results, the expenses and income of DFS Energy are disclosed separately.
- Financial indicators (IFRS and HGB) are used for the planning and control of the commercial business.

Reconciliation from charges-related result before interest and taxes to IFRS Group earnings before interest and taxes		
	31 Dec 2019	31 Dec 2018
	€'000	€'000
Terminal services	-76,418	-53,765
En-route services	46,128	76,026
Commercial business	-3,131	-2,562
Other regulated and commercial business	4,550	8,472
Charges-related earnings before interest and taxes (EBIT)	-28,871	28,171
Occupational pensions from a charges-related perspective	211,998	156,961
Occupational pensions under IFRS	-178,548	-167,620
Change in equity relevant to charges (closing deficit)	-40,564	6,403
Minority interest	4,052	0
Consolidation/reconciliation	1,001	-528
Group earnings before interest and taxes under IFRS	-30,932	23,387

Information on the business segments by cost type			
	Regulated business	Commercial business	Group earnings
2019	€'000	€'000	€'000
Revenues	1,022,667	87,050	1,109,717
Changes in inventory and other own work capitalised	20,325	-1,737	18,588
Other operating income	46,954	5,798	52,752
Total operating revenues and income	1,089,946	91,111	1,181,057
Material expenses	-6,565	-4,368	-10,933
Employee expenses	-872,535	-62,692	-935,227
Depreciation, amortisation and impairments	-104,530	-4,418	-108,948
Other operating expenses	-139,171	-17,710	-156,881
Total costs	-1,122,801	-89,188	-1,211,989
Earnings before interest and taxes (EBIT)	-32,855	1,923	-30,932
Financial income	212,252	3,219	215,471
Financial expenses	-148,645	-1,464	-150,109
Financial result	63,607	1,755	65,362
Profit (loss) before income taxes	30,752	3,678	34,430
Income taxes	3,003	-2,646	357
Earnings for the period (continuing operations)	33,755	1,032	34,787
Shareholder of the parent company	33,755	1,880	35,635
Earnings attributable to minority interests	0	-848	-848

Information on the business segments by cost type

	Regulated business	Commercial business	Group earnings
2018	€'000	€'000	€'000
Revenues	1,041,814	65,239	1,107,053
Changes in inventory and other own work capitalised	17,745	-297	17,448
Other operating income	51,542	1,877	53,419
Total operating revenues and income	1,111,101	66,819	1,177,920
Material expenses	-6,567	-5,925	-12,492
Employee expenses	-832,810	-46,053	-878,863
Depreciation, amortisation and impairments	-114,207	-3,953	-118,160
Other operating expenses	-131,185	-13,833	-145,018
Total costs	-1,084,769	-69,764	-1,154,533
Earnings before interest and taxes (EBIT)	26,332	-2,945	23,387
Financial income	118,986	663	119,649
Financial expenses	-171,826	-1,882	-173,708
Financial result	-52,840	-1,219	-54,059
Profit (loss) before income taxes	-26,508	-4,164	-30,672
Income taxes	1,047	-470	577
Earnings for the period (continuing operations)	-25,461	-4,634	-30,095

Information on important external customers

	2019	2019	2018	2018
	€'000	ln %	€'000	ln %
DFS total revenues ¹¹⁾	1,082,941	100.00	1,133,188	100.00
Deutsche Lufthansa	166,638	15.39	174,612	15.41
Eurowings	70,012	6.46	73,262	6.47
Ryanair	65,649	6.06	68,433	6.04
Federal Ministry of Defence	52,902	4.89	59,470	5.25
easyJet Airline	49,212	4.54	49,331	4.35
British Airways	27,958	2.58	31,257	2.76
KLM Royal Dutch Airlines	29,744	2.75	30,741	2.71
Wizz Air Hungary	25,905	2.39	27,375	2.42
Emirates	24,803	2.29	26,422	2.33
Turkish Airlines	23,595	2.18	23,984	2.12

¹¹⁾ Comprising terminal and en-route revenues as well as revenues from military operational air traffic

35 Cash flow statement

The cash flow statement shows the change in liquid funds between two balance sheet dates to show the movements in cash and cash equivalents for the DFS Group. Cash inflows and outflows are divided into operating, investing and financing activities and only show cash flows from continuing operations. There are no discontinued operations.

Short overview of the consolidated cash flow statement		
	31 Dec 2019	31 Dec 2018
	€'000	€'000
Cash outflow/inflow from operating activities	77,239	-198,326
Cash outflow from investing activities	-118,029	-110,907
Cash inflow from financing activities	34,081	201,127
Changes to cash in the business year	-6,709	-108,106
Cash and cash equivalents at the beginning of the year	1,132,255	1,240,361
Cash and cash equivalents at the end of the year	1,125,546	1,132,255

Cash inflow from operating activities was calculated using the indirect method by adjusting net income for changes in inventory, receivables, other assets and borrowings as well as depreciation and amortisation and other non-cash income and expenses. The cash flows from income taxes relate to all three of the above areas of activity. However, owing to the time that would be involved in assigning the cash flows from income taxes to the individual activities, for the purpose of the cash flow statement they were allocated to operating activities.

The DFS Group does not present the cash flows from operating activities according to the direct method (IAS 7.19).

Cash outflows from investing and financing activities are presented using the direct method.

Cash and cash equivalents at the end of the year are made up as follows:

	31 Dec 2019	31 Dec 2018
	€'000	€'000
Financial assets	758,948	677,166
Cash in hand and cheques	31	35
Cash at bank	366,567	455,054
Cash and cash equivalents at the end of the year	1,125,546	1,132,255

36 Financial instruments

Financial assets by measurement category						
	Carrying amount	Amortised cost	Assets at fair value through profit or loss	Equity instruments at fair value through other comprehensive income	Fair value	Level
31 Dec 2019	€'000	€'000	€'000	€'000	€'000	€'000
Financial assets at fair value						
Financial assets	758,948		758,948		758,948	2
Investments	17,098			17,098	17,098	3
Financial assets not at fair value						
Loans	7,338	7,338			7,338	3
Trade receivables	152,245	152,245			152,245	3
QTE transaction	29,371	29,371			29,371	2
Receivables from EU grant funding	49,011	49,011			49,011	3
Capitalised value	5,675	5,675			5,675	2
Trusteeship (Treuhandverein)	14,531	14,531			14,531	2
Interest receivables	1,274	1,274			1,274	2
Receivables from investments	55	55			55	3
Other financial assets – Level 3	1,922	1,922			1,922	3
Liquid funds	366,598	366,598			366,598	2
	1,404,066	628,020	758,948	17,098	1,404,066	

Financial assets by measurement category						
	Carrying amount	Amortised cost	Assets at fair value through profit or loss	Equity instruments at fair value through other comprehensive income	Fair value	Level
31 Dec 2018	€'000	€'000	€'000	€'000	€'000	€'000
Financial assets at fair value						
Financial assets	677,166		677,166		677,166	2
Investments	17,076			17,076	17,076	3
Financial assets not at fair value						
Loans	7,869	7,869			7,869	3
Trade receivables	157,741	157,741			157,741	3
Contract assets	7,146	7,146			7,146	3
QTE transaction	36,004	36,004			36,004	2
Receivables from EU grant funding	42,564	42,564			42,564	3
Capitalised value	3,856	3,856			3,856	2
Trusteeship (Treuhandverein)	6,168	6,168			6,168	2
Interest receivables	1,341	1,341			1,341	2
Receivables from investments	72	72			72	3
Other financial assets – Level 3	1,451	1,451			1,451	3
Liquid funds	455,089	455,089			455,089	2
	1,413,543	719,301	677,166	17,076	1,413,543	

Valuation technique

Cost approach: For loans to investments, the DFS Group assumes they can be sold for at least their carrying amounts in the short term and sets their fair values at the same level. The fair values of the investments can be calculated reliably and backed up with financial calculations. The Group values the stake in FCS Flight Calibration Services using the equity method, with the total carrying amount reflecting the proportionate changes in equity.

Due to the predominantly short-term nature of trade receivables, other receivables and assets as well as of liquid funds, the carrying amounts at the balance sheet date do not differ significantly from their fair values. The Group therefore assumes that these assets can be sold for at least their carrying amounts in the short term and sets their fair values at the same level.

Market approach: The fair values of securities and financial assets are determined completely or partially using recognised valuation models or the valuations of third parties based on the market conditions prevailing at the balance sheet date (interest and exchange rates) using external sources or market prices. In determining the fair value of derivatives, compensating effects from the primary transaction (pending business or anticipated transactions) are excluded.

Present value method: The fair value of the QTE transaction is determined based on discounting future expected cash flows.

Unobservable inputs

Discount rate, nominal value of investments as well as other receivables and assets

Observable inputs

Security prices, market interest rates

Relationship between inputs and fair value

The estimated fair value would increase if

- the risk-adjusted discount rate was lower
- the nominal values were higher
- the security prices were higher
- the market interest rates were higher

Reconciliation of the fair values of level 2 and 3

	Level 2	Level 3	Level 2	Level 3
	31 Dec 2019	31 Dec 2019	31 Dec 2018	31 Dec 2018
	€'000	€'000	€'000	€'000
As at 1 Jan	1,179,624	233,919	1,294,136	210,691
Ongoing gains (+) and losses (-)	88,966	-6,432	-21,437	-3,174
Gains (+) and losses (-) recognised in other comprehensive income	0	0	-7,946	0
Additions (+) and disposals (-)	-92,193	182	-85,129	26,402
Transfers in and out of levels	0	0	0	0
As at 31 Dec	1,176,397	227,669	1,179,624	233,919

Financial liabilities by measurement category					
	Carrying amount	Amortised cost	Liabilities at fair value through profit or loss	Fair value	Level
31 Dec 2019	€'000	€'000	€'000	€'000	€'000
Financial liabilities at fair value					
Derivative financial instruments	705		705	705	2
Financial liabilities not at fair value					
Debenture loans	197,500	197,500		208,836	2
QTE transaction	29,785	29,785		29,785	2
Financial debt from the capital investments of the investment entity	270	270		270	2
Finance lease liabilities	23,053	23,053		23,053	3
Trade payables	26,033	26,033		26,033	3
Staff costs	24,258	24,258		24,258	3
Amounts owed to Shareholder	9,451	9,451		9,451	3
Liabilities to investments	1,483	1,483		1,483	3
Outstanding invoices	8,057	8,057		8,057	3
Interest payable	3,446	3,446		3,446	2
Liabilities from the capital investments of the investment entity	1,790	1,790		1,790	3
Share of en-route charges: German Meteorological Service	967	967		967	3
Other financial liabilities – Level 3	638	638		638	3
	327,436	326,731	705	338,772	

Financial liabilities by measurement category					
	Carrying amount	Amortised cost	Liabilities at fair value through profit or loss	Fair value	Level
31 Dec 2018	€'000	€'000	€'000	€'000	€'000
Financial liabilities at fair value					
Derivative financial instruments	1,965		1,965	1,965	2
Financial liabilities not at fair value					
Debenture loans	197,500	197,500		212,844	2
QTE transaction	36,612	36,612		36,612	2
Financial debt from the capital investments of the investment entity	573	573		573	2
Trade payables	30,808	30,808		30,808	3
Staff costs	27,856	27,856		27,856	3
Amounts owed to Shareholder	4,815	4,815		4,815	3
Liabilities to investments	1,308	1,308		1,308	3
Outstanding invoices	10,861	10,861		10,861	3
Interest payable	3,605	3,605		3,605	2
Liabilities from the capital investments of the investment entity	399	399		399	3
Share of en-route charges: German Meteorological Service	933	933		933	3
Other financial liabilities – Level 3	1,023	1,023		1,023	3
	318,258	316,293	1,965	333,602	

Valuation technique

Cost approach: Due to the predominantly short-term nature of trade payables and other liabilities, the carrying amounts at the balance sheet date do not differ significantly from their fair values. The DFS Group assumes that the fair values of these liabilities are at least equal to the settlement value from a current obligation.

Market approach: The fair values of debenture loans and financial debt are determined completely or partially using recognised valuation models or the valuations of third parties based on the market conditions prevailing at the balance sheet date (interest and exchange rates) using external sources or market prices. In determining the fair value of derivatives, compensating effects from the primary transaction (pending business or anticipated transactions) are excluded. The fair value of the bonds is determined using market listings on public markets.

Present value method: The fair value of finance leases and the QTE transaction is determined by discounting future expected cash flows using prevailing market interest rates.

Unobservable inputs

Discount rate, settlement value of other liabilities and liabilities

Observable inputs

Exchange prices, exchange rates, market interest rates

Relationship between inputs and fair value

The estimated fair value would increase if

- the risk-adjusted discount rate was lower
- the settlement values were higher
- the exchange prices were higher
- the exchange rates were higher
- the market interest rates were higher

Reconciliation of the fair values of level 2 and 3

	Level 2	Level 3	Level 2	Level 3
	31 Dec 2019	31 Dec 2019	31 Dec 2018	31 Dec 2018
	€'000	€'000	€'000	€'000
As at 1 Jan	255,599	78,003	265,062	81,061
Ongoing gains (+) and losses (-)	0	0	0	0
Gains (+) and losses (-) recognised in other comprehensive income	0	0	0	0
Additions (+) and disposals (-)	-12,557	17,727	-9,463	-3,058
Transfers in and out of levels	0	0	0	0
As at 31 Dec	243,042	95,730	255,599	78,003

Net results of financial instruments by measurement category

	Financial assets			Financial liabilities
	Amortised cost	At fair value through profit or loss	At fair value through other comprehensive income	Amortised cost
31 Dec 2019	€'000	€'000	€'000	€'000
Income (+) from investments			551	
Gains (+) from foreign currency translation	838	8,440		
Gains (+) and losses (-) from remeasurement	7,172	73,830		
Expenses (-) from impairments	-6,432			
Interest income (+)	2,761	13,520		
Interest expense (-)	-68	-687		-6,009
Other financial expenses (-)	-1,703	-1,905		-80
Gains (+) and losses (-)	2,568	93,198	551	-6,089
Recognised directly in other comprehensive income	0	0	0	0
31 Dec 2018	€'000	€'000	€'000	€'000
Income (+) from investments			721	
Gains (+) from foreign currency translation	828	12,860		
Gains (+) and losses (-) from remeasurement	-2,106	-32,993		
Expenses (-) from impairments	-3,174	-26		
Interest income (+)	2,032	7,844		
Interest expense (-)	-23	-358		-6,077
Other financial expenses (-)	-566	-1,269		-118
Gains (+) and losses (-)	-3,009	-13,942	721	-6,195
Recognised directly in other comprehensive income	0	0	-7,246	0

37 Derivative financial instruments

The DFS Group is exposed to market risks in the form of interest and currency fluctuations. The Group uses derivative financial instruments to manage these risks.

In addition, the DFS Group is exposed to default risk. To minimise this risk, it concludes derivative transactions exclusively with its core bankers, who have good credit ratings.

Speculative transactions with derivative instruments where there is no underlying transaction are forbidden.

Derivative financial instruments					
	Remaining term	Nominal volume	Fair value	Nominal volume	Fair value
		31 Dec 2019	31 Dec 2019	31 Dec 2018	31 Dec 2018
		€'000	€'000	€'000	€'000
Positive fair value					
Futures	Up to 1 year	3,341	3,341	904	904
		3,341	3,341	904	904
Negative fair value					
Futures	Up to 1 year	-705	-705	-1,965	-1,965
		-705	-705	-1,965	-1,965

The futures were concluded as part of the capital investments through the investment entity and are due within six months.

38 Financial risks

Financial risks arise in the form of liquidity risks, default risks and market price risks. The DFS Group provides disclosures in the Group management report in section 6.2.2 on the required qualitative disclosures under IFRS 7 about the type and means by which risks from financial instruments arise as well as the procedures for the management of these risks. The objective is to avoid new, and minimise existing, risks. The Group continuously monitors and analyses the events on the financial markets in a critical dialogue with its core banks and the rating agency to reassess existing strategies and develop new strategies.

The assessment of the consolidated financial risks of the DFS Group is given by the rating awarded by the rating agencies.

Ratings			
	Long-term	Short-term	Outlook
Standard & Poor's	AAA	A-1+	Stable

38.1 Liquidity risks

Liquidity risk describes the risk that the DFS Group may not be in the position to settle its financial liabilities as contractually required through the delivery of cash or other financial assets.

Maturities of undiscounted principal and interest payments from financial liabilities					
	Up to 3 months	4 to 12 months	2 to 5 years	More than 5 years	Total
31 Dec 2019	€'000	€'000	€'000	€'000	€'000
Non-derivative financial liabilities					
Debenture loans	0	87,500	110,000	0	197,500
Interest	2,538	2,631	7,617	0	12,786
Financial debt from the capital investments of the investment entity	270	0	0	0	270
Finance lease liabilities	2,334	24	24	20,671	23,053
QTE transaction	7,704	0	22,081	0	29,785
Trade payables	25,584	117	332	0	26,033
Other liabilities	42,912	7,178	0	0	50,090
Derivative financial liabilities					
Derivatives	705	0	0	0	705
	82,047	97,450	140,054	20,671	340,222
31 Dec 2018	€'000	€'000	€'000	€'000	€'000
Non-derivative financial liabilities					
Debenture loans	0	0	197,500	0	197,500
Interest	0	5,170	12,786	0	17,956
QTE transaction	7,389	0	29,223	0	36,612
Financial debt from the capital investments of the investment entity	573	0	0	0	573
Trade payables	30,238	0	570	0	30,808
Other liabilities	43,438	7,362	0	0	50,800
Derivative financial liabilities					
Derivatives	1,965	0	0	0	1,965
	83,603	12,532	240,079	0	336,214

The DFS Group holds a relatively high level of liquid funds (€366.60 million), which it uses to service its financial liabilities. In addition, it regularly monitors the expected incoming payments, especially from trade receivables and other assets.

38.2 Default risks

The DFS Group is exposed to default risks from financial receivables that result from the possible default on the obligations of a party to a contract. The maximum value equals the positive fair value or market value of the financial instrument.

Default risk by category	31 Dec 2019 €'000	31 Dec 2018 €'000
Amortised cost	628,020	719,301
At fair value through profit or loss	758,948	677,166
At fair value through other comprehensive income	17,098	17,076
	1,404,066	1,413,543

With the exception of trade receivables, there are no financial assets that were overdue or impaired. Trade receivables are continuously monitored and are written down as necessary to the amount that could be recovered as soon as information on the insolvency of customers became available. The Group demands security deposits from customers with relevant sales volumes when defined warning thresholds are exceeded. In addition, there are no indications that the debtors whose receivables are overdue will not be able to fulfil their obligations.

As regards financial investing, the Group only enters into transactions with counterparties who either have a long-term rating of at least A+ (Standard & Poor's) or A1 (Moody's), short-term A-2 (Standard & Poor's) or P-2 (Moody's), or a correspondingly high creditworthiness or other form of collateral.

Business dealings with a select group of core banks are conducted using uniform standards and existing reciprocal cash flows are continuously improved.

38.3 Market risks

Market risk is defined as the risk that the fair values or future cash flows of a primary or derivative financial instrument change due to fluctuations in market prices (interest rate risk and currency risk). Interest rate risk arises primarily when refinancing with variable rates. Currency risks result from exchange rate fluctuations for transactions in foreign currencies.

Interest rate risk results mainly from the sensitivity of financial instruments. Liquidity is ensured by means of the money market and capital market programme with short maturities and fixed and variable interest rates as well as from fund assets not protected against insolvency. The use of derivative financial instruments, such as interest rate swaps and cross-currency interest rate swaps, secures fixed interest rates and thus limits interest rate risk. The changes in interest rates therefore have no material impact on the result or equity.

The obligation and plan assets for DFS Group occupational pensions are exposed to interest rate risk. The discount rate for pensions and similar obligations is based on the market yields for high-quality fixed-rate corporate bonds. The continued decline in the level of interest rates would lead to a further increase in the obligation. The low returns that can currently be earned on the market mean that the pension plan assets cannot yield substantial income, which reduces the speed at which the assets for occupational pensions may grow.

Interest rate risk for financial liabilities			
		31 Dec 2019	31 Dec 2018
		€'000	€'000
Fixed-rate debenture loans		197,500	197,500
		197,500	222,500

Foreign exchange risks that impact the balance sheet arise due to monetary items that are not in the functional currency. As the primary monetary financial instruments are held mainly in the functional currency or converted into the functional currency by means of derivatives, changes in exchange rates therefore have no material impact on the result or equity.

Net risk by currency				
	31 Dec 2019	31 Dec 2019	31 Dec 2018	31 Dec 2018
	Nominal	Value at	Nominal	Value at
	value	reporting date	value	reporting date
	\$'000	€'000	\$'000	€'000
Primary transactions	259	232	371	324
Derivative financial instruments	0	0	0	0
Planned hedges	0	0	0	0
	£'000	€'000	£'000	€'000
Primary transactions	1	2	0	0
Derivative financial instruments	0	0	0	0
Planned hedges	0	0	0	0
	CHF'000	€'000	CHF'000	€'000
Primary transactions	0	0	22	20
Derivative financial instruments	0	0	0	0
Planned hedges	0	0	0	0

The value-at-risk analysis conducted determines the currency and interest risk, which is based on a sensitivity model used for internal planning and control. Through historical simulations of statistical time series on relevant past financial market data, scenarios are extrapolated into the future and used to compute simulated changes in market values for financial instruments. The analysis shows the absolute decline which will not be exceeded with a probability of 95.00 percent when the holding period is ten days.

Value-at-risk				
	31 Dec 2019 Foreign exchange risk €'000	31 Dec 2019 Interest rate risk €'000	31 Dec 2018 Foreign exchange risk €'000	31 Dec 2018 Interest rate risk €'000
By currency				
USD (\$)	14	0	18	0
EUR	0	2,067	0	243
By line item				
Money market	0	19	0	1
Capital market	0	2,089	0	244
Hedge	14	3	18	1
Overall risk	Value at year end €'000	Highest value €'000	Lowest value €'000	Annual average €'000
2019	2,078	2,319	23	616
2018	250	1,311	250	765

39 Capital management

As regards commercial considerations, the capital of the Group is managed first of all from a charges-related/regulatory perspective. This perspective takes additional elements into account when contrasted with the accounting principles under IFRS:

- Consideration of the catch-up effects from the conversion to IAS/IFRS not included in the financial statements
- Inclusion of the model to finance occupational pensions approved by the regulatory authority
- Law on the Implementation of the Mutual Assistance Directive as well as on the Change to Tax Regulations (*Amtshilferichtlinie-Umsetzungsgesetz*)
- Integration of DFS Energy
- Integration of the commercial business
- Consideration of uncontrollable costs

The integration of the commercial business improves the quality of the information about intra-Group relationships and allows a transparent separation between the regulated and commercial business. The commercial business should make an above-average contribution to net income and the build-up of equity as its profits are not subject to regulation.

The 'regulated' perspective includes the future flow of charges approved by the supervisory authorities and delivers a clear picture of the capital structure, debts and cash flows. Assets and liabilities that are subject in full or in part to economic regulation are transferred to a regulatory asset base, i.e. an accounting of the results and financial position from the perspective of economic regulation.

This view of the DFS Group is supported by the supplement to Section 31b(3) of the German Aviation Act (LuftVG). This regulation obliges the Group to determine its taxes based on the charges-related result.

Reconciliation and indicators of the regulated business		
	31 Dec 2019	31 Dec 2018
	€'000	€'000
Group equity recognised on the balance sheet	-1,419,247	-665,507
Catch-up effects not yet accounted for	136,137	201,223
Deferred taxes on this amount	-6,542	-3,661
Occupational pensions from a charges-related perspective	2,213,664	1,360,430
Change in equity relevant to charges (closing deficit)	410,810	442,716
Consolidation/reconciliation	-17,599	-11,291
Regulated equity	1,317,223	1,323,910
Equity ratio	26.56%	31.92%
Return on equity	2.64%	-2.27%
Net income/loss	34,787	-30,095
EBIT	-30,932	23,387
Borrowings	3,641,388	2,823,373
Debt ratio	73.44%	68.08%
Return on total assets	0.70%	-0.73%
Leverage ratio ¹²⁾	-17.63%	-21.59%
Liquid funds	366,598	455,089
Financial assets	758,948	677,166
Non-current financial liabilities	152,776	226,723
of which QTE transaction	[22,081]	[29,224]
Current financial liabilities	98,537	9,927
of which QTE transaction	[7,704]	[7,388]
Financial net assets (+)	874,233	895,605

¹²⁾ If the sign is negative, there is overcompensation by liquid funds.

40 Contingent liabilities and other financial obligations

40.1 Contingent liabilities

Maturities of sureties					
	Up to 1 year	2 to 5 years	More than 5 years	Indefinite term	Total
	€'000	€'000	€'000	€'000	€'000
2019	1,974	366	0	434	2,774
2018	352	1,983	50	369	2,754

No provisions were recognised for the obligations shown because the risk of use was deemed to have a low probability. There are no uncertainties as regards the amount or maturity of the contingent liabilities.

Sureties relate to guarantees for prepayments, warranties, contract fulfilment and tender guarantees for simulation, radar data and air navigation facilities. At the end of the business year, there were no obligations for the issuance or endorsement of guarantees covering bills of exchange and cheques.

40.2 Other financial obligations

Due dates of other financial obligations				
	Up to 1 year	2 to 5 years	More than 5 years	Total
31 Dec 2019	€'000	€'000	€'000	€'000
Intercompany credit lines to associated companies	1,500	0	0	1,500
of which taken up	0	0	0	0
Capital expenditure commitments for				
intangible assets	27,045	18,740	0	45,785
property, plant and equipment	28,188	28,094	3,978	60,260
material costs	71,240	48,896	1,168	121,304
rental, leasing, tenancy	1,584	1,476	1,310	4,370
bank guarantee	0	10,000	0	10,000
	129,557	107,206	6,456	243,219
31 Dec 2018	€'000	€'000	€'000	€'000
Intercompany credit lines to associated companies	1,500	0	0	1,500
of which taken up	0	0	0	0
Capital expenditure commitments for				
intangible assets	11,231	38,168	0	49,399
property, plant and equipment	49,974	29,737	4,166	83,877
material costs	56,717	60,492	4,952	122,161
rental, leasing, tenancy	1,432	1,942	611	3,985
bank guarantee	0	10,000	0	10,000
	120,854	140,339	9,729	270,922

No provisions were recognised for the obligations shown because the risk of use was deemed to have a low probability. No uncertainties exist as regards the amount or maturity of the other financial obligations.

To cover liquidity needs, the associated company was granted an intercompany credit line which can be taken up daily as part of the cash pool. By doing so, the Group optimises its conditions for cash investments and loans and exploits the advantages of a central, systematic financial planning.

Capital expenditure obligations relate to the contractual obligations for the purchase of intangible assets as well as property, plant and equipment.

41 Contingent assets

There are three separate abstract acknowledgements of debt (<i>abstrakte Schuldanerkenntnisse</i> – a standard German law acknowledgement of a borrower’s indebtedness) between DFS and FCS:			
Effective from	26 April 2006	29 September 2008 and 6 October 2008, respectively	21 August 2018 / 24 September 2018, respectively
Collateral	Registration of a charge The grant for cancellation of the registered charge was notarised at the beginning of 2020.	Registration of a charge	Registration of a charge
Legal basis	Section 1 LuftfzG (Law on Rights regarding Aircraft – <i>Gesetz über Rechte an Luftfahrzeugen</i>)	Section 1 LuftfzG (Law on Rights regarding Aircraft – <i>Gesetz über Rechte an Luftfahrzeugen</i>)	Section 1 LuftfzG (Law on Rights regarding Aircraft – <i>Gesetz über Rechte an Luftfahrzeugen</i>)
Beneficiary	DFS	DFS	DFS
Object	Hawker Beechcraft Super King Air	Hawker Beechcraft Super King Air	Hawker Beechcraft Super King Air
Serial number	FL-473 D-CFMD	FL-626 D-CFME	FL-1156
Local Court	Braunschweig	Braunschweig	Braunschweig
Registration	22 August 2006	16 September 2009	In the first half of 2019
Basis	Loan agreement dated March 2006	Loan agreement dated September 2008 / October 2008	Loan agreement dated August 2018 / September 2018
Contract partner	DFS IBS and FCS	DFS IBS and FCS	DFS IBS and FCS
Loan 1	€5.50 million for the aeroplane FL-473 D- CFMD with a term until 31 December 2022	€4.30 million for the aeroplane FL-626 D- CFME with a term until 31 December 2025	€5.56 million for the aeroplane FL-1156 with a term until 31 December 2033
Loan 2	€3.00 million for the flight inspection system (type Aerodata AeroFIS) with a term until 31 December 2016	€1.70 million for the flight inspection system (type Aerodata AeroFIS) with a term until 30 December 2019	
Miscellaneous	The loan for the aeroplane is collateralised over its entire maturity by an abstract acknowledgement of debt in favour of DFS by means of a liability of €8.50 million. €7.10 million of the volume of the loan have been taken up.	The loan for the aeroplane is collateralised over its entire maturity by an abstract acknowledgement of debt in favour of DFS by means of a liability of €6.00 million. €5.20 million of the volume of the loan have been taken up.	The loan for the aeroplane is collateralised over its entire maturity by an abstract acknowledgement of debt in favour of DFS by means of a liability of €5.56 million. The loan sum has been called up in full.

42 Post-balance-sheet-date events

- The former Managing Director Operations Robert Schickling left the company on 31 January 2020 at his own request.
- On 1 February 2020, Dirk Mahns took over the responsibilities of the Directorate Operations as Chief Operating Officer and on 1 March 2020, Friedrich-Wilhelm Menge took over the responsibilities of the Directorate Technology as Chief Technology Officer.
- The Managing Director Human Resources and Labour Director, Dr Michael Hann, tragically passed away on 13 February 2020. Until further notice, this function has been taken over by the Chairman of the Board of Managing Directors, Prof Klaus-Dieter Scheurle. The Supervisory Board will discuss the succession in due course.
- Peter Schaaf resigned from the DFS Supervisory Board with effect from 17 January 2020. His successor was Oktay Kaya.
- Dr Martina Hinricher resigned her mandate and thus from her function as chairperson of the Supervisory Board of DFS with effect from 25 February 2020. The Shareholder appointed Dr Tamara Zieschang as successor and member of the Supervisory Board with effect from 26 February 2020.

Due to the progressive spread of the coronavirus, increasingly restrictive countermeasures are being taken both nationally and globally. This has manifested itself, for example, in the cancellation of major events. For example, the World ATM Congress in Madrid (10 to 12 March 2020), the most prestigious trade fair for the industry, was cancelled. In addition, the Board of Managing Directors decided that DFS and its subsidiaries would not take part in the planned date for the AERO trade fair (1 to 4 April 2020) in Friedrichshafen, Germany, for safety reasons. In addition, the Board of Managing Directors took far-reaching measures within the Group as a precautionary step in order to safeguard operations. The trend of declining air traffic is becoming increasingly entrenched in the first quarter of 2020. The Board of Managing Directors therefore expects a significant impact on earnings.

The DFS Group saw no additional post-balance-sheet-date events of material importance, whether individually or as a group, which impact the results and financial position of the Group.

43 Independent auditor's fees

Total fees of the auditor under Section 314(1)(9) of the German Commercial Code (HGB)		
	31 Dec 2019	31 Dec 2018
	€'000	€'000
Audit of the annual financial statements	197	156
Other assurance services	37	87
Tax advice	6	1
Other services	370	3
	610	247

44 Service concession arrangements

Under Section 27c of the German Aviation Act (LuftVG), the DFS Group is obliged to perform its sovereign tasks (see section 1.2 in the Group management report). The details of these tasks are regulated by an indefinite framework agreement with the Federal Republic of Germany.

The law and the framework agreement authorise the Group as the current entrusted air navigation service provider to require the airport operators under Section 27d of the German Aviation Act (LuftVG) to:

- establish and maintain the necessary facilities and take the necessary structural measures in these facilities; make the necessary facilities available and allow cables to be laid, connected and maintained on the premises,
- enable the air navigation services personnel to use the infrastructure at aerodromes.
- ensure that the buildings and rooms made available by the aerodrome operator are provided with power, thermal energy, heating and air-conditioning; perform other utility services and ensure that waste disposal services are rendered.

In return, the Group reimburses the airport operators for these costs.

Under Section 311b(1) of the German Aviation Act (LuftVG), the DFS Group is alone entrusted with the performance of the services outlined in Section 27c(2)(1)(1) LuftVG (supplemented by the German Ordinance on Terminal Charges of the Air Navigation Services (FSAAKV)). If another air navigation service provider is entrusted with the services outlined in Section 27c(2)(1)(2)-(5) LuftVG, the legal and contractual rights and obligations transfer to this air navigation service provider.

Charges levied are the main source of revenues at the DFS Group and they should cover the planned costs.

44.1 Control Centre division

Since 1 January 2012, the European Commission has regulated en-route services by means of a performance scheme for air navigation services and network functions. It has laid down performance targets and alert thresholds for the whole European Union for the areas of safety, environment, capacity and cost-efficiency for one reference period. Each reference period comprises five years. To gather experience in the introductory phase, the first reference period was limited to three years (2012-2014).

The national supervisory authority, the Federal Supervisory Authority for Air Navigation Services (BAF), then draws up a performance plan at the national or functional airspace block level that is aligned with the performance targets of the European Union. Upon proposal of the national supervisory authorities, Member States adopt their performance plans and communicate them to the Commission. The Commission evaluates the performance plans and suggests, or takes, corrective measures.

With the start of economic regulation, the business risk for the DFS Group has risen. The cost risks that arise within a reference period impact the profits of the Group directly. However, the traffic risk is spread between the Group and the airspace users. Section 3.1.3 in the Group management report contains information on the split of risks stemming from variances in traffic volume.

The variances are determined by the Federal Supervisory Authority for Air Navigation Services (BAF) and reported to the European Commission and EUROCONTROL. EUROCONTROL checks the differences and submits the adjustments to the representatives of the Member States in the Enlarged Committee for Route Charges. This Committee prepares the adjusted unit rates for en-route services after consultation with the airspace users. These are submitted to the enlarged Commission for final approval.

The Federal Ministry of Transport and Digital Infrastructure (BMVI) publishes the unit rate for en-route services in the Federal Law Gazette on the basis of the German Ordinance on Route Charges of the Air Navigation Services (FSStrKV) and taking into consideration the EU Regulations on a common charging scheme for air navigation services.

44.2 Tower division

Since 2015, terminal services have also been subject to a regime of economic regulation. The Federal Ministry of Transport and Digital Infrastructure (BMVI) lays down a unit rate each year on the basis of the German Ordinance on Terminal Charges of the Air Navigation Services (FSAKV) and taking into consideration the EU Regulations on a common charging scheme for air navigation services.

To this end, the DFS Group sends the national supervisory authority, the Federal Supervisory Authority for Air Navigation Services (BAF), a preliminary cost estimate for the coming year. The cost estimate is based on the costs of the last business year and the estimates of the cost development in the current and following business year. The unit rate is calculated from the quotient between the planned costs and the planned traffic volume.

45 Related party disclosures

45.1 Related parties – entities

In the normal course of business, services are also rendered to related entities. Group companies render services to the DFS Group as well. Within the Group, there are some billing agreements with reciprocal service provision charged as cost allocations. These extensive delivery and service relationships are conducted at market prices or using the cost-plus method and are no different from the business relationships with other companies.

During consolidation, the DFS Group eliminates the balances and transactions between the ultimate parent company and the consolidated subsidiaries (related parties). These are not disclosed in the Notes.

Outstanding balances			
	Shareholder	Associated companies	Investments
2019	€'000	€'000	€'000
Financial assets		21,776	2,660
Other assets	622	113	77
Other liabilities	-10,073	-1,589	-29
2018	€'000	€'000	€'000
Financial assets		22,228	2,717
Other assets	773	87	72
Other liabilities	-5,588	-1,395	

Income (+) and expenses (-)	Shareholder	Associated companies	Investments
	€'000	€'000	€'000
2019	€'000	€'000	€'000
Revenues	73,416	326	206
Purchased services		-3,679	
Employee expenses	-8,531		
Other operating expenses		-3,595	254
Interest income		229	
Income from investments			551
2018	€'000	€'000	€'000
Revenues	79,058	431	213
Purchased services		-3,786	
Employee expenses	-8,483		
Other operating expenses		-3,044	-268
Interest income		163	
Income from investments			721

The DFS Group maintains business relations with the sole controlling Shareholder, the Federal Republic of Germany, and with other companies controlled by it as part of the entrusted sovereign functions for air navigation services. These transactions are conducted at arm's length and are no different from the delivery and service relationships with other companies. DFS avails itself of the exemption in IAS 24.25 and does not disclose information on outstanding balances and transactions with government-related entities.

The DFS Group aims to exert material influence on the Single European Sky (SES) initiative of the European Commission as part of its strategic orientation. To this end, the Group has been an active member of the SESAR Joint Undertaking (SJU) since June 2009, along with other leading organisations. This initiative developed and updated the requirements on air traffic management networks, the most suitable technologies and procedures. Since 2014, the SESAR development process has moved to the long-term phase of technical implementation and the setting up of air traffic management (ATM) procedures (deployment management). As part of a cross-industry partnership, the DFS Group won the contract to plan, coordinate and implement a comprehensive modernisation of European airspace within the scope of the deployment management for the time period 2014 to 2020. The task is financed out of the European funding programme, where a total of roughly €3 billion is earmarked for deployment management. The Group is thus able to influence the introduction of new technologies and benefits from the considerable funding, as well as from the avoidance of incorrect cost allocation and flawed capital expenditures.

45.2 Related parties – persons

Related parties (persons) cover primarily the Board of Managing Directors, Level 1 managers, the Supervisory Board and their family members. There were no material or, in their form or character, atypical reportable transactions between the DFS Group and people in key positions of management and their close families that go beyond existing employment, service or purchasing relationships and their contractual compensation. The following contains disclosures on the emoluments of the Board of Managing Directors and the Supervisory Board.

46 Organs of the parent company

46.1 Board of Managing Directors

Prof Klaus-Dieter Scheurle, Frankfurt am Main,
Chairman and Chief Executive Officer

Robert Schickling, Bad Homburg vor der Höhe,
Managing Director Operations (until 31 January 2020)

Dr Michael Hann, Bad Dürkheim,
Managing Director Human Resources and Labour Director
(until 13 February 2020)

Dirk Mahns, Dreieich-Buchsschlag,
Chief Operating Officer (from 1 February 2020)

Friedrich-Wilhelm Menge, Pfronten,
Chief Technology Officer (from 1 March 2020)

See section 1.3 in the Group management report for the distribution of responsibilities of the Board of Managing Directors.

Payments due in the short term for members of the Board of Managing Directors			
	Fixed components (including benefits in kind)	Performance- related components	Total emoluments
2019	€'000	€'000	€'000
Prof Klaus-Dieter Scheurle (Chairman)	340	157	497
Robert Schickling	292	136	428
Dr Michael Hann	299	136	435
	931	429	1,360
2018	€'000	€'000	€'000
Prof Klaus-Dieter Scheurle (Chairman)	349	151	500
Robert Schickling	292	133	425
Dr Michael Hann	301	133	434
	942	417	1,359

Post-employment benefits			
	Pension benefits	Pension payments	Expenses for pension benefits earned in the current year¹³⁾
2019	€'000	€'000	€'000
Prof Klaus-Dieter Scheurle (Chairman)	2,240	0	315
Robert Schickling	3,096	0	148
Dr Michael Hann	1,996	0	265
Former Managing Directors	15,938	796	264
	23,270	796	992
2018	€'000	€'000	€'000
Prof Klaus-Dieter Scheurle (Chairman)	1,697	0	291
Robert Schickling	2,572	0	145
Dr Michael Hann	1,509	0	253
Former Managing Directors	15,015	788	262
	20,793	788	951

¹³⁾ Service cost and interest cost

The DFS Group did not grant any advance payments, loans or benefits to members of the Board of Managing Directors or former Managing Directors on their termination. In addition, it paid no remuneration from consultancy or service contracts. There were no other long-term benefits due or share-based compensation.

46.2 Supervisory Board

Shareholder representatives

Dr Martina Hinricher

Chairperson

Head of division for personnel welfare and occupational safety (*Geschäftsbereichsleiterin Personalfürsorge und Arbeitssicherheit*)

Autobahn GmbH (owned by the German Federal Government)

(Supervisory Board Member and Chairperson until 25 February 2020)

Frank Best

Colonel (G.S.)

Federal Ministry of Defence

Carmen von Bornstaedt-Radbruch

Ministerialrätin

Federal Ministry of Defence

Antje Geese

Ministerialdirigentin

Federal Ministry of Transport and Digital Infrastructure

Dr Angelika Krepplein

Regierungsdirektorin

Federal Ministry of Finance

Dr Carl-Stefan Neumann

Management consultant

Staff representatives

Markus Siebers

Deputy Chairperson

Air traffic controller

Sabrina Leitzbach

Air traffic controller

Peter Schaaf

Chairperson Central Staff Council

Air traffic controller

(Supervisory Board Member until 17 January 2020)

André Vöcking

Air navigation services engineer

Andrea Wächter

Head of Hamburg Tower

Jörg Waldhorst

Senior expert aviation

In the business year, there were four scheduled ordinary meetings and two extraordinary meetings.

Remuneration of the Supervisory Board	31 Dec 2019 €'000	31 Dec 2018 €'000
Carmen von Bornstaedt-Radbruch	2.40	0.50
Frank Best	3.10	0.50
Antje Geese	3.10	1.30
Catja Gräber	0.00	0.20
Dr Martina Hinricher	3.50	0.90
Andreas Hoppe	0.00	0.40
Dr Angelika Kreppein	2.80	0.90
Sabrina Leitzbach	2.70	0.50
Volker Möller	0.00	0.50
Dr Carl-Stefan Neumann	3.20	1.20
Peter Schaaf	2.20	0.60
Hagen Schlütter	0.00	0.20
Markus Siebers	3.20	0.80
André Vöcking	2.60	0.40
Andrea Wächter	2.40	0.70
Jörg Waldhorst	2.40	0.50
	33.60	10.10

The remuneration of the members of the Supervisory Board is regulated by Shareholder resolutions. Until 30 June 2019, the remuneration received was made up of a fee for meeting attendance of €80.00 per meeting and a daily allowance of €26.00 per meeting. From 1 July 2019, the members of the Supervisory Board receive an annual remuneration of €4,000.00. This annual remuneration amounts to €5,000.00 for the chairpersons of the committees and the deputy chairperson of the Supervisory Board and €6,000.00 for the chairperson of the Supervisory Board. The remuneration was paid pro rata temporis for 2019.

The members of the Supervisory Board received no advances, loans or remuneration from consultancy or service contracts.

47 Disclosures on the Public Corporate Governance Code (PCGK)

The DFS Group is subject to the Public Corporate Governance Code of the Federation (PCGK). The Board of Managing Directors and the Supervisory Board jointly issue a compliance statement each year and publish the corporate governance report on the website of the company.

Langen, 5 March 2020

Prof Klaus-Dieter Scheurle
Chairman and
Chief Executive Officer

Dirk Mahns
Chief Operating Officer
Managing Director
(from 1 February 2020)

Friedrich-Wilhelm Menge
Chief Technology Officer
Managing Director
(from 1 March 2020)

Independent Auditor's Report*

To DFS Deutsche Flugsicherung GmbH, Langen

Opinions

We have audited the consolidated financial statements of DFS Deutsche Flugsicherung GmbH, Langen, and its subsidiaries (the Group), comprising the consolidated balance sheet as at 31 December 2019, the statement of comprehensive income from 1 January to 31 December 2019, the consolidated statement of changes in equity and the consolidated cash flow statement for the business year from 1 January to 31 December 2019 and the Notes to the consolidated financial statements including a summary of significant accounting policies. In addition, we have audited the group management report of DFS Deutsche Flugsicherung GmbH for the business year from 1 January to 31 December 2019. In accordance with German legal requirements, we have not audited the contents of the declaration of the legal representatives (Board of Managing Directors) under Section 289(f)(4) of the German Commercial Code (HGB) on the proportion of women in the upper executive levels.

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

- the attached consolidated financial statements comply, in all material respects, with IFRS as adopted by the EU, the additional legal requirements of the German Commercial Code under Section 315(e)(1) and, in compliance with these requirements, give a true and fair view of the results and financial position of the Group as at 31 December 2019 and the earnings for the business year from 1 January to 31 December 2019 and
- the attached group management report as a whole provides an appropriate view of the Group's position. This group management report is consistent in all material respects with the consolidated financial statements, complies with German legal requirements and suitably presents the opportunities and risks of future development. Our audit opinion on the group management report does not cover the non-financial group statement and the group governance declaration (including any other statements) as well as the following disclosures not related to the management report.

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

Basis for the audit opinions

We have conducted our audit of the consolidated financial statements and the group management report in accordance with Section 317 HGB and German generally accepted standards for the audit of financial statements promulgated by the *Institut der Wirtschaftsprüfer* [Institute of Public Auditors in Germany] (IDW). Our responsibilities under those requirements and principles are further described in the section entitled "Auditor's responsibilities for the audit of the consolidated financial statements and of the group management report" of our Auditor's Report. We are independent of the Group companies in accordance with the requirements of German commercial and professional law and have satisfied our other German professional responsibilities in accordance with these requirements. We believe the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinions on the consolidated financial statements and on the group management report.

Material uncertainty in connection with the ability to continue as a going concern

We draw attention to the information given in Note 42 "Post-balance-sheet-date events" and section 7 "Outlook" in the group management report, in which the Board of Managing Directors describes that the spread of COVID-19 will have a significant direct impact on the global aviation industry and will negatively affect revenues and earnings in the business year 2020. As stated in the Notes, these events and circumstances indicate the existence of a material uncertainty which may cast significant doubt on the company's ability to continue as a going concern, and which constitutes a risk threatening the existence of the company within the meaning of Section 322(2)(3) HGB. Our audit opinions have not been modified in light of these matters.

Other information

The Board of Managing Directors is responsible for the other information. The other information comprises the declaration of compliance with the German Sustainability Code (www.deutscher-nachhaltigkeitskodex.de) provided before the date of this Auditor's Report and the Corporate Governance Report under No. 6.1 of the German Public Corporate Governance Code of the Federation (PCGK).

Our audit opinions on the consolidated financial statements and the group management report do not extend to the other information and, accordingly, we do not express either an audit opinion or any other form of audit conclusion on them.

In connection with our audit, we have the responsibility to read the other information and to assess whether the other information:

- displays material discrepancies with the consolidated financial statements, the group management report or the findings obtained during the audit.
- or otherwise appears to be materially misrepresented.

Should we conclude that there is a material misrepresentation in this other information on the basis of our work, we are required to report on this fact. We have nothing to report in this regard.

Responsibility of the Board of Managing Directors and the Supervisory Board for the consolidated financial statements and the group management report

The Board of Managing Directors is responsible for preparing consolidated financial statements that comply in all material respects with IFRS as adopted by the EU, and with the additional requirements of German law under Section 315(e)(1) HGB, as well as for ensuring that the consolidated financial statements give a true and fair view of the results and financial position of the Group while observing the German principles of proper accounting (GoB). In addition, the Board of Managing Directors are responsible for the internal controls they have deemed necessary under the German principles of proper accounting to enable the preparation of consolidated financial statements that are free from material misstatement, whether intentional or unintentional.

In preparing the consolidated financial statements, the Board of Managing Directors is responsible for assessing the Group's ability to continue as a going concern. Furthermore, it is responsible for disclosing matters relating to the going concern status, if relevant. In addition,

it is responsible for financial reporting based on the going concern basis of accounting unless there is an intention to liquidate the Group or to cease operations, or there is no realistic alternative but to do so.

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

The Supervisory Board is responsible for overseeing the Group's financial reporting process for the preparation of the consolidated financial statements and of the group management report.

Auditor's responsibilities for the audit of the consolidated financial statements and of the group management report

Our objective is to obtain reasonable assurance on whether the consolidated financial statements as a whole are free from material misstatement – whether intentional or unintentional – and whether the group management report as a whole provides an appropriate view of the Group's position and is, in all material respects, consistent with the consolidated financial statements and the findings obtained in the audit, complies with German legal requirements and appropriately presents the opportunities and risks of future development, as well as to issue an auditor's report that includes our audit opinions on the consolidated financial statements and on the group management report.

Reasonable assurance is a high degree of assurance, but it is not a guarantee that an audit conducted in accordance with Section 317 HGB and German generally accepted standards for the audit of financial statements promulgated by the *Institut der Wirtschaftsprüfer* (IDW) will always detect a material misstatement. Misstatements can arise from fraud or error and are considered material if, individually or in aggregate, they could reasonably be expected to influence the economic decisions of addressees taken on the basis of these consolidated financial statements and this group management report.

We exercise professional judgement and maintain an attitude of professional scepticism during the audit. In addition:

- We identify and assess the risks of material misstatement in the consolidated financial statements and in the group management report – whether intentional or unintentional – design and perform audit procedures in response to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our audit opinions. The risk of non-detection of material misstatements resulting from fraud is higher than one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the overriding of internal controls.
- We obtain an understanding of the internal control system relevant to the audit of the consolidated financial statements and of the arrangements and measures relevant to the audit of the group management report in order to design audit procedures that are appropriate in the circumstances, but not for the objective of expressing an audit opinion

on the effectiveness of the company's systems.

- We evaluate the appropriateness of accounting policies used by the Board of Managing Directors and the reasonableness of estimates and related disclosures made by the Board of Managing Directors.
- We draw conclusions on the appropriateness of the Board of Managing Directors' use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Group's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in the Auditor's Report to the related disclosures in the consolidated financial statements and in the group management report or, if such disclosures are inadequate, to modify our audit opinion. Our conclusions are based on the audit evidence obtained up to the date of our Auditor's Report. However, future events or conditions may cause the Group to cease to be able to continue as a going concern.
- We evaluate the overall presentation, structure and contents of the consolidated financial statements, including the disclosures, and whether the consolidated financial statements present the underlying transactions and events in such a way that the consolidated financial statements give a true and fair view of the results and financial position of the Group while observing the German principles of proper accounting.
- We obtain sufficient appropriate audit evidence regarding the financial information of the companies or business activities within the Group to express audit opinions on the consolidated financial statements and on the group management report. We are responsible for the direction, supervision and performance of the group audit. We remain solely responsible for our audit opinions.
- We evaluate the consistency of the group management report with the consolidated financial statements, its compliance with the law, and the view of the Group's position it provides.
- We perform audit procedures on the forward-looking information presented by the Board of Managing Directors in the group management report. On the basis of sufficient, appropriate audit evidence we evaluate, in particular, the significant assumptions used by the Board of Managing Directors as a basis for the forward-looking information, and evaluate the proper derivation of the forward-looking information from these assumptions. We do not express a separate audit opinion on the forward-looking information and on the assumptions used as a basis for such. There is a substantial, unavoidable risk that future events will differ materially from the forward-looking information.

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

Frankfurt am Main, 13 March 2020

Mazars GmbH & Co. KG
Wirtschaftsprüfungsgesellschaft
Steuerberatungsgesellschaft

Susanne Schorse
Auditor

Martin Lächele
Auditor

*Courtesy translation; see page 3

DFS Deutsche Flugsicherung GmbH

Acronyms and abbreviations

AEROSENSE	FREQUENTIS DFS AEROSENSE GmbH, Vienna, Austria
AfA	Official German Schedule for Deductions for Depreciation – <i>Absetzung für Abnutzung</i>
AFIS	Aerodrome Flight Information Service
AG	Public Limited Company – <i>Aktiengesellschaft</i>
AktG	German Stock Corporation Act – <i>Aktiengesetz</i>
AIM	Aeronautical Information Management
AIP	Aeronautical Information Publication
AIS	Aeronautical Information Service
AmtshilfeRLUmsG	German Law on the Implementation of the Mutual Assistance Directive as well as on the Change to Tax Regulations – <i>Amtshilferichtlinie-Umsetzungsgesetz</i>
ANA	L'Administration de la Navigation Aérienne du Luxembourg, Findel, Luxembourg (Luxembourg air navigation service provider)
ANS	Air Navigation Solutions Limited, London, United Kingdom
ANS	Air Navigation Services
ANSP	Air Navigation Service Provider
AS	Aeronautical Solutions (former division of DFS)
ATC	Air Traffic Control
ATCAS	Air Traffic Control Automation System
ATM	Air Traffic Management
ATS	Air Traffic Services
ATZ-TV	Collective Agreement on Partial Retirement at DFS – <i>Altersteilzeit-Tarifvertrag</i>
AUC	Assets under Construction
AUSTRO CONTROL	Austro Control Österreichische Gesellschaft für Zivilluftfahrt mbH, Vienna, Austria (Austrian air navigation service provider)
BAF	Federal Supervisory Authority for Air Navigation Services, Langen, Germany – <i>Bundesaufsichtsamt für Flugsicherung</i>
BARIG	Board of Airline Representatives in Germany
BDF	German Airline Association – <i>Bundesverband der Deutschen Fluggesellschaften</i>
BDL	German Aviation Association – <i>Bundesverband der Deutschen Luftverkehrswirtschaft</i>
BFS	Federal Administration of Air Navigation Services – <i>Bundesanstalt für Flugsicherung</i>
BGBI	German Federal Law Gazette – <i>Bundesgesetzblatt</i>
BHD	Bahraini Dinar
BilReG	German Accounting Law Reform Act – <i>Bilanzrechtsreformgesetz</i>
BILSODA	BILSODA GmbH & Co. KG, Pullach, Germany
BMF	Federal Ministry of Finance, Berlin, Germany – <i>Bundesministerium der Finanzen</i>
BMVg	Federal Ministry of Defence, Bonn, Germany – <i>Bundesministerium der Verteidigung</i>
BMVI	Federal Ministry of Transport and Digital Infrastructure, Berlin, Germany – <i>Bundesministerium für Verkehr und digitale Infrastruktur</i>
BMWi	Federal Ministry for Economic Affairs and Energy, Berlin, Germany – <i>Bundesministerium für Wirtschaft und Energie</i>
BSI	Federal Office for Information Security – <i>Bundesamt für Sicherheit in der Informationstechnik</i>
BSI KritisV	German Ordinance defining Critical Infrastructures pursuant to the Act on the Federal Office for Information Security – <i>Verordnung zur Bestimmung Kritischer Infrastrukturen nach dem BSI-Gesetz</i>
CEF	Connecting Europe Facility
CEO	Chief Executive Officer
CHF	Swiss Franc
CHRO	Chief Human Resources Officer

CMS	Compliance Management System
CNS	Communications, Navigation and Surveillance
Co.	Compagnie
COO	Chief Operating Officer
CORSIA	Carbon Offsetting and Reduction Scheme for International Aviation
Co. W. L. L.	Company with Limited Liability
CTO	Chief Technology Officer
DAIO	Departures, Arrivals, Internals and Overflights
DANS	Dubai Air Navigation Services
DAS	DFS Aviation Services GmbH, Langen, Germany
DAS Bahrain	DFS Aviation Services Bahrain Co. W.L.L., Manama, Bahrain
DCF	Discounted Cash Flow
de	Country Code Domain for Germany
DFS	DFS Deutsche Flugsicherung GmbH, Langen, Germany
DFS Energy	DFS Energy GmbH, Langen, Germany
DFS IBS	DFS International Business Services GmbH, Langen, Germany
DFS U-Kasse	DFS Unterstützungskasse GmbH, Langen, Germany (Benevolent Fund)
DIW	German Institute for Economic Research, Berlin, Germany – <i>Deutsches Institut für Wirtschaftsforschung</i>
DLR	German Aerospace Centre – <i>Deutsches Zentrum für Luft- und Raumfahrt e.V</i>
DM	Deutschmark – German Mark
DRS	Dresden International Airport
DSNA	Direction des Services de la Navigation Aérienne (French air navigation service provider)
Droniq	Droniq GmbH, Frankfurt, Germany
DVOR	Doppler VHF (Very High Frequency) Omnidirectional Radio Range
DWD	German Meteorological Service, Offenbach, Germany – <i>Deutscher Wetterdienst</i>
EAD	European AIS Database
EAL	Edinburgh Airport Ltd, Edinburgh, Scotland
EANPG	European Air Navigation Planning Group
EASA	European Aviation Safety Agency, Cologne, Germany
EBIT	Earnings before Interest and Taxes
EBITDA	Earnings before Interest, Taxes, Depreciation & Amortisation
EBT	Earnings before Taxes
EC	European Community
EEG	Energy Sources Act – <i>Erneuerbare-Energien-Gesetz</i>
EGNOS	European Geostationary Navigation Overlay Service
Eisenschmidt	R. Eisenschmidt GmbH, Egelsbach, Germany
EMU	Economic and Monetary Union
eNM/S19	Enhanced NM/ANSPs Network Measures for Summer 2019
ESSP SAS	European Satellite Services Provider Société par Actions Simplifiée, Toulouse, France
ETV	Collective Agreement on the Grading System at DFS – <i>Eingruppierungstarifvertrag</i>
EU	European Union
EUR	Euro
EUROCONTROL	European Organisation for the Safety of Air Navigation, Brussels, Belgium
EUROSTAT	Statistical Office of the European Union, Luxembourg
e.V.	Registered Association – <i>eingetragener Verein</i>
FAB(EC)	Functional Airspace Block (Europe Central)
FCS	FCS Flight Calibration Services GmbH, Braunschweig, Germany
FIR	Flight Information Region
FMC	Flughafen Magdeburg-Cochstedt GmbH, Hecklingen, Germany
FO IOP	Flight Object Interoperability

FSAAKV	German Ordinance on Terminal Charges of the Air Navigation Services – <i>Flugsicherungs-An- und Abflug-Kostenverordnung</i>
FS-AuftragsV	German Regulation concerning the Commissioning of an Air Navigation Services Enterprise – <i>Verordnung zur Beauftragung eines Flugsicherungsunternehmens</i>
FS-DiensteVO	German Service Provision Regulation – <i>Flugsicherungsdienste-Verordnung</i>
FS-DurchführungsV	German Air Navigation Services Regulation – <i>Verordnung über die Durchführung der Flugsicherung</i>
FSStrKV	German Regulation on Route Charges – <i>Flugsicherungs-Streckenkostenverordnung</i>
FührposGleichberG	German Law on the Equal Participation of Women and Men in Management Positions in the Private Sector and in Public Service – <i>Gesetz für die gleichberechtigte Teilhabe von Frauen und Männern an Führungspositionen in der Privatwirtschaft und im öffentlichen Dienst</i>
GBP	Pound Sterling (£)
GdF	Air Navigation Services Union – <i>Gewerkschaft der Flugsicherung</i>
GDP	Gross Domestic Product
GmbH	Limited Liability Company – <i>Gesellschaft mit beschränkter Haftung</i>
GmbHG	Act Concerning Limited Liability Companies – <i>Gesetz betreffend die Gesellschaften mit beschränkter Haftung</i>
GoB	German Principles of Proper Accounting – <i>Grundsätze ordnungsmäßiger Buchführung</i>
GPS	Global Positioning System
GroupEAD	GroupEAD Europe S. L., Madrid, Spain
GS2 VCS	Intercom System 2 Voice Communication System
HGB	German Commercial Code – <i>Handelsgesetzbuch</i>
HRB	Commercial Register B – <i>Handelsregister Abteilung B</i>
IAS	International Accounting Standards
IASB	International Accounting Standards Board
IATA	International Air Transport Association
ICAO	International Civil Aviation Organisation
iCAS	iTEC (interoperability Through European Collaboration) Centre Automation System
ICS	Internal Control System
IDW	Institute of Public Auditors in Germany – <i>Institut der Wirtschaftsprüfer in Deutschland e.V.</i>
IDW PS	Auditing Standards (<i>Prüfungsstandards</i>) from the Institute of Public Auditors in Germany (IDW)
ifo	Leibniz Institute for Economic Research at the University of Munich e.V., Munich, Germany – <i>Leibniz-Institut für Wirtschaftsforschung an der Universität München e.V.</i>
IFR	Instrument Flight Rules
IFRIC	International Financial Reporting Interpretations Committee
IFRS	International Financial Reporting Standards
IfW Kiel	Kiel Institute for the World Economy – <i>Kieler Institut für Weltwirtschaft</i>
IMC	Instrument Meteorological Conditions
ISIS-XM	Improved Speech Integrated System
ISO	International Organisation for Standardisation
IWH	Halle Institute for Economic Research, Halle, Germany – <i>Leibniz-Institut für Wirtschaftsforschung Halle</i>
KAT	Kaufbeuren ATM Training GmbH, Kaufbeuren, Germany
KfW	Kreditanstalt für Wiederaufbau, Frankfurt, Germany (German government-owned development bank)
KG	Partnership – <i>Kommanditgesellschaft</i>
KPA	Key Performance Area
KTV	Collective Agreement on Health and Long-term Care Insurance at DFS – <i>Kranken- und Pflegeversicherungstarifvertrag</i>
LBA	Federal Aviation Office, Braunschweig, Germany – <i>Luftfahrt-Bundesamt</i>
Ltd.	Limited

LufABw	German Military Aviation Authority, Cologne Wahn, Germany – <i>Luftfahrtamt der Bundeswehr</i>
LuftfzgG	German Law on Rights regarding Aircraft – <i>Gesetz über Rechte an Luftfahrzeugen</i>
LuftVG	German Aviation Act – <i>Luftverkehrsgesetz</i>
LuftVStAbsenkV	German Ordinance on Decreasing the Air Transport Tax – <i>Luftverkehrsteuer-Absenkungsverordnung</i>
LuftVStFestV	German Law laying down German Air Transport Tax – <i>Luftverkehrsteuer-Festlegungsverordnung</i>
LuftVStG	German Air Transport Tax – <i>Luftverkehrsteuergesetz</i>
LZK-TV	Collective Agreement governing Long-term Time Accounts at DFS – <i>Langzeitkontentarifvertrag</i>
MaRS	Modernisation and Replacement of Surveillance Infrastructure at DFS
mFUND	Research Initiative of the German Ministry of Transport and Digital Infrastructure – <i>Modernitätsfonds</i>
MTV	Collective Framework Agreement at DFS – <i>Manteltarifvertrag</i>
MUAC	Maastricht Upper Area Control Centre
n	Represents the Current Business Year
NM	Network Manager
No.	Number
NATS	National Air Traffic Services, Whiteley, Fareham, United Kingdom (UK air navigation service provider)
NORACON	NORth European and Austrian CONSortium (International consortium of nine air navigation service providers from Austria, Denmark, Estonia, Finland, Iceland, Ireland, Norway and Sweden)
NORD/LB	Landesbank of Lower Saxony and Saxony-Anhalt – <i>Norddeutsche Landesbank Girozentrale</i> , Hannover, Germany
NOTAM	Notice to Airmen
NV	Naamloze Vennootschap (Belgian public limited company)
OAT	Operational Air Traffic
OCI	Other Comprehensive Income
OECD	Organisation for Economic Co-operation and Development, Paris, France
OJT	On-the-Job Training
P.	Page
P1	Project 1
PCGK	German Public Corporate Governance Code – <i>Public Corporate Governance Kodex</i>
PEI	Paul Ehrlich Institute, Langen, Germany
PMV	Participatiemaatschappij Vlaanderen NV, Brussels, Belgium
QBIC Arkiv	QBIC Arkiv FUND NV, Ghent, Belgium
QBIC Feeder	QBIC FEEDER FUND NV, Ghent, Belgium
QTE	Qualified Technological Equipment (cross-border)
RASUM	Radio Site Upgrade and Modernisation at DFS
RMC	Risk Management Committee
RMS	Risk Management System
RP	Reference Period
RTC	Remote Tower Control
RWI	RWI-Leibniz Institute for Economic Research, Essen, Germany – <i>Leibniz-Institut für Wirtschaftsforschung e.V.</i>
S.A.	Société Anonyme (a type of public company)
S-ATM	Sectorless Air Traffic Management
SDA	SESAR Deployment Alliance
SES	Single European Sky
SESAR	Single European Sky Air Traffic Management Research
SJU	SESAR Joint Undertaking
SKYNAV S.A.	SKYNAV Société Anonyme, Awans, Belgium
S. L.	Sociedad de Responsabilidad Limitada

SSC	Single Sky Committee
STATFOR	Statistics and Forecast Service (at EUROCONTROL)
StrukturTV	Collective Agreement on Structural Measures and Early Retirement at DFS – <i>Tarifvertrag über Strukturmaßnahmen und Vorruhestand</i>
TATS	Tower Air Traffic Services S. L., Madrid, Spain
Terra Drone	Terra Drone Corporation, Tokyo, Japan
TranspRLG	Transparency Directive Implementation Act – <i>Transparenzrichtlinie-Umsetzungsgesetz</i>
TVöD	Collective Agreement for the Public Service – <i>Tarifvertrag für den öffentlichen Dienst</i>
UAS	Unmanned Aircraft System
UAV	Unmanned Aerial Vehicle
UIR	Upper Flight Information Region
Unify	Unify NV, Antwerp, Belgium
USD	United States Dollar (\$)
UTM	Unmanned Traffic Management
ÜVersTV	Collective Agreement on Pensions and Transitional Payments at DFS – <i>Übergangsversorgungstarifvertrag</i>
VAFORIT	Very Advanced Flight Data Processing Operational Requirements Implementation
VaR	Value at Risk
VersTV	Collective Agreement on Pensions at DFS – <i>Versorgungstarifvertrag</i>
VFR	Visual Flight Rules
VHF	Very High Frequency
VITO	Flemish Institute for Technological Research – <i>Vlaamse Instelling Voor Technologisch Onderzoek</i> , Mol, Belgium
VMC	Visual Meteorological Conditions
VTV	Agreement covering Remuneration at DFS – <i>Vergütungstarifvertrag</i>
VTV-A	Agreement covering Remuneration for Apprentices at DFS – <i>Vergütungstarifvertrag der Auszubildenden</i>
WACC	Weighted Average Cost of Capital
WpHG	German Securities Trading Act – <i>Wertpapierhandelsgesetz</i>
ZTV	Agreement covering Allowances at DFS – <i>Zulagentarifvertrag</i>

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