Annual report 2018

ADVA™
Optical Networking

Open edge networking

Contents

ADVA overview

Welcome

Profile

ADVA is a company founded on innovation and focused on helping our customers succeed.

Our technology forms the building blocks of a shared digital future and empowers networks across the globe. We're continually developing breakthrough hardware and software that leads the networking industry and creates new business opportunities.

It's these open connectivity solutions that enable our customers to deliver the cloud and mobile services that are vital to today's society and for imagining new tomorrows.

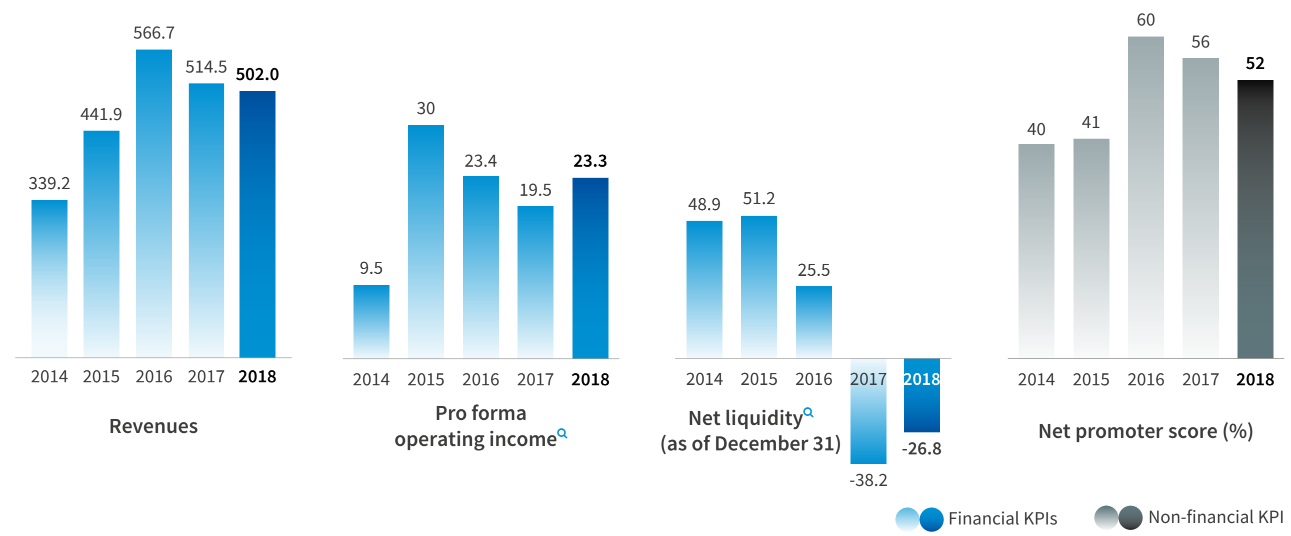
Together, we're building a truly connected and sustainable future.

Mission

ADVA enables open next-generation networks. The group's mission is to be the trusted partner for connecting, extending and assuring the cloud.

2018 key performance indicators

(in millions of EUR, except net promoter score)



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ADVAntages

Focus on growth markets

- ADVA focuses on growth markets in the telecom space that have one thing in common: a strong and sustainable demand for innovative connectivity solutions.
- These markets are driven by the digitization of society and its ecosystems. The global megatrends “cloud” and “mobility” accelerate the demand for more bandwidth, demand a faster and more flexible service creation and require ultra-precise network synchronization.
- The total addressable market for ADVA was estimated to be USD 14 billion in 2018 and will, according to industry analysts, grow to USD 21 billion by 2023*.

*Industry analyst estimates for access, metro and long-haul WDM equipment (“optical”) and access switching & routing (“packet edge”) relevant to ADVA. Sources: Ovum, “optical networks forecast 2018-2023” published January 2019 and “service provider switching and routing forecast 2018-2023”, published August 2018

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Speed for customers

- ADVA has a strong track record of being first to market with new functionality that adds value for customers.
- A responsive team serves customers around the globe, with 49.6% of ADVA’s 2018 revenues generated in EMEA (Europe, Middle East and Africa), 38.3% in the Americas and 12.1% in Asia-Pacific.
- ADVA’s innovative networking solutions have been deployed by several hundred service providers and thousands of enterprises around the globe.

Innovation

- ADVA’s industry-leading engineering force is focused on three key technologies that are strategically important for the modernization of networks. The company outperforms the engineering power of other vendors in relevant applications.
- Focus on innovation drives market success and has made ADVA the global leader for data center interconnect solutions for private enterprises with a market share of close to 25% globally and more than 40% in EMEA.
- The company is a technology leader in cloud access solutions (Carrier Ethernet with NFV) and in network synchronization, expanding its current market share*.

* Ovum, “market share data center interconnect 3Q18”, published November 2018

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Trusted partner

- ADVA’s unique combination of innovation, focus and speed has seen the group build close partnerships with customers, resulting in repeat purchases and strong cross-selling opportunities for its innovative networking solutions.
- As a trusted partner for two decades, ADVA provides high-quality solutions with lowest cost of ownership and best user experience.
- ADVA is led by a dynamic, international, experienced and highly-motivated management team with many years of senior management background, making it a dependable partner when it comes to building long-term business relationships.

ADVA overview
Welcome

2018 business highlights

- Four solid quarters of sequential growth and profitability
- Efficient integration of MRV
- Technology investments delivering increasing returns

Customer achievements and awards

In 2018, ADVA solutions helped global service providers and enterprises across all industries to tackle soaring bandwidth demand and meet the challenges of an increasingly complex network environment. Many customers realized the benefits of openness and disaggregation through ADVA technology and many more mission-critical networks were protected with ConnectGuard™ encryption. Here are a few of the highlights from the last 12 months:

NYIIX uses ADVA’s metro solution to answer fierce data demand

ADVA FSP 3000 CloudConnect™ provides seamless path to 400Gbit/s and beyond

Ensemble chosen as key component of Fujitsu's managed networks solution

Ensemble's open technology provides access to industry's widest NFV portfolio

VERBUND deploys ADVA FSP 3000 to power renewable energy ambitions

Austria’s leading electricity provider upgrades to sustainable, future-proof solution

NYSERNet deploys ADVA FSP 3000 CloudConnect™ in statewide R&E network

OpenFabric™ cross-connect and ROADM technology provide automation, openness and agility

Oscilloquartz selected as finalist in Light Reading’s Leading Lights Awards

Industry-first modular sync solution with 10G interfaces shortlisted in Most Innovative Telecoms Product category

Chaos Computer Club leverages ADVA’s high-capacity transport solution

ADVA FSP 3000 CloudConnect™ links 12,000 tech conference participants to international internet exchange

St. John’s University harnesses ADVA FSP 3000 for 100G R&E network

ADVA and Techgardens partner to deliver highly efficient, fully redundant core transport solution

ADVA wins multiple Nordic banking customers with encryption technology

ConnectGuard™ security solution now safeguarding data in several major financial networks

Previder tackles enterprise cloud demand with ADVA’s DCI solution

OpenFabric™ OTN cross-connect technology protects previous investment and enables future growth

TReNT assures dark fiber network with ADVA ALM fiber monitoring solution

Real-time, in-service assurance technology dramatically reduces cost and helps keep SLA promises

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KU Leuven harnesses ADVA FSP 3000 CloudConnect™ for 32G Fibre Channel transport
ADVA and Arcadiz Telecom build pioneering research and education DCI network

Colt builds new global uCPE solution on Ensemble Connector
ADVA's open NFV platform enables rapid service innovation and deployment

Azercell deploys Oscilloquartz timing tech for nationwide rollout of LTE
Complete sync solution enables future LTE-A services while maximizing value of installed infrastructure

Datacenter One secures customer data with ADVA ConnectGuard™ encryption
ADVA FSP 3000 with Layer 1 protection delivers robust security in financial network

ADVA selected as finalist for Network Transformation Awards
Judges recognize pioneering cloud encryption solution and Prayson Pate's contribution to driving NFV success

ADVA scoops ECOC award with pioneering Ethernet technology for 5G fronthaul
Showcase of SDN-enabled 100G Ethernet aggregator for low-latency, time-accurate mobile services voted best demo

Eurofiber rolls out ADVA FSP 150 for future-proof business services
Zero touch provisioning, comprehensive assurance and Layer 3 features add key value to CPE solution

Tencent trials ADVA FSP 3000 TeraFlex™ 600G DCI technology over its open line system OPC-4
First demo in China to showcase ultra-high-bandwidth disaggregated network solution

Pilot sets new standard for uptime with ADVA ALM fiber monitoring solution
Real-time network assurance technology enables rapid troubleshooting for SLA-based services

inexio meets soaring data demand with ADVA FSP 3000 CloudConnect™
New DCI technology fits into existing architecture for seamless path to 200G connectivity

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Innovation and corporate events

2018 saw ADVA continue its mission to identify and develop new solutions for the cloud, with a focus on increasing simplicity, flexibility and efficiency. As well as bringing secure zero touch provisioning to the network edge for effortless service activation, ADVA launched ConnectGuard™ Cloud, the industry's first virtualized encryption solution. ADVA was at the heart of key breakthroughs in the field of quantum security and demonstrated the power of multi-layer network slicing and assurance for 5G. These were some of the supporting announcements:

ADVA to demo multi-layer network slicing and assurance for 5G at MWC
Showcase is key step to enabling enhanced mobile broadband, self-driving cars and massive IoT

Oscilloquartz unveils industry-first modular sync solution with 10G interfaces
OSA 5430's hardware redundancy delivers resiliency and scale with ultimate timing precision

ADVA simplifies the network edge with secure zero touch provisioning
ADVA FSP 150 ProNID demarcation products make service activation effortless

DLR and ADVA set new world record for optical free-space data transmission
Satellite laser communications trial using ADVA FSP 3000 CloudConnect™ key step to closing digital divide

ADVA secures the cloud with industry's first virtualized encryption solution
ConnectGuard™ Cloud and Ensemble Connector effortlessly deliver military-grade security with zero touch provisioning

ADVA FSP 3000 powers UK's first quantum network
Openness of optical platform enables quantum key distribution for super-encrypted data transport

ADVA achieves world-first 100G quantum-safe transport over 2,800km
Pioneering joint demo highlights how future-proof ultra-secure encryption is available today for existing telco networks

Oscilloquartz launches ePRTC solution for 5G network timing
System featuring high-performance cesium clock with carrier-grade grandmaster and clock combiner improves accuracy and reduces reliance on GNSS

Ensemble delivers major new release for NFV management and orchestration at scale
Ensemble suite addresses real-world needs of Tier 1 operators with focus on simplicity, zero touch provisioning and multi-layer security

ADVA scores industry first with Gen 6 Fibre Channel qualification
ADVA FSP 3000 CloudConnect™ excels in 32G FC tests over 135km between data centers

ADVA ConnectGuard™ Ethernet security solution succeeds in rigorous EANTC tests
Vendor-neutral trials prove value of robust, low-latency ADVA FSP 150 edge encryption technology

ADVA brings optimized 100G service aggregation to the network edge
New FSP 150 technologies boost capacity and flexibility in data center and metro networks

ADVA redefines service demarcation for the small cell era
Industry's most compact cell site gateway solution offers Carrier Ethernet and IP services with precise synchronization

ADVA delivers 300G over trans-Atlantic distance in FSP 3000 TeraFlex™ trial
Unique submarine demo transports data 6,800km using commercially available transponder

ADVA simplifies network operations with launch of Ensemble Controller
Consolidated network management and SDN control delivers easy route to virtualized networking and automated operations

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Interoperability and alliance partnerships

ADVA continued to play a central role in major joint innovation projects in 2018, advancing interoperability and bringing TIP's open, disaggregated packet optical solution to the market. Here's a selection of relevant headlines:

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GRNET trials ADVA FSP 3000 CloudConnect™ and TIP's Voyager white box solution

Disaggregated multi-vendor architecture transports 200G more than 500km

ADVA and Amartus demo automated service lifecycle management using MEF 3.0 architecture

PoC built on ADVA Pro-Vision® opens the door to streamlined operations and accelerated service activation

Oscilloquartz timing toolkit excels in EANTC interoperability tests

Highly agile OSA 5421 provides precise phase synchronization for LTE-A services over multi-vendor legacy networks

ADVA and BringCom demo virtualized uCPE with ONAP orchestration

Ensemble Connector interoperates with ONAP in unique MEF showcase

ADVA expands Partner Ecosphere Program

PEP widens scope of hugely successful partner ecosystem and provides new opportunities for more resellers

European industry consortium successfully demonstrates SDN-based reach planning in a multi-vendor optical network field trial

Celtic-Plus project SENDATE simplifies operations of open optical networks

ADVA brings the Telecom Infra Project's Voyager solution to the market

Industry's first fully open and disaggregated packet optical solution is now commercially available

ADVA commits to developing complete commercial solution for TIP's disaggregated cell site gateway group

New offering will be perfectly timed to help mobile network operators embrace 5G opportunities

Management Board

Members and their backgrounds

ADVA is led by a dynamic, international, experienced and highly-motivated team. Leading, directing and managing the group's growth are four executive officers:

Brian Protiva, chief executive officer

Christoph Glingener, chief technology officer, chief operating officer

Ulrich Dopfer, chief financial officer

Scott St. John, chief marketing and sales officer

Brian Protiva

Chief executive officer (CEO)
Born in 1964

Bachelor of Science in electrical engineering, Stanford University, USA

Brian Protiva co-founded ADVA in 1994. As the CEO, he is responsible for overall strategy, human resources and quality management. Under Brian's leadership, ADVA advanced to become a global market leader in Ethernet access devices and one of the top players in metro wavelength division multiplexing (WDM) worldwide. To date, ADVA's innovative networking solutions have been deployed in more than 10,000 enterprises and more than 300 carrier networks around the world. Prior to leading ADVA, Brian was managing director at AMS Technologies (now the EGORA Group), which he joined in 1987 and where he focused on co-managing its subsidiaries.

Christoph Glingener

Chief technology officer (CTO), chief operating officer (COO)
Born in 1968

Ph.D. in electrical engineering, University of Dortmund, Germany

Dr. Christoph Glingener joined ADVA in April 2006, assuming responsibility for all global research and development activities and was appointed CTO in 2007. Since that time, he has also led ADVA's product management and advanced technology teams. Christoph has focused on streamlining ADVA's product portfolio, defining the product strategy and building the group's standing as a global innovator in optical networking. Strategic partnerships, mergers and acquisitions are an integral part of this strategy. Additionally, in January 2015, Christoph took on responsibility for global operations, enabling ADVA to integrate research and development, new product introduction and global operations into a unified development operations team. Christoph's activities at ADVA build on a long and successful industry career with experience gained in both academic and corporate roles. These include leading positions at Marconi Communications (now Ericsson) and Siemens Communications (now Infinera).

Ulrich Dopfer

Chief financial officer (CFO)
Born in 1973

Graduate in business administration, Verwaltungs- und Wirtschaftsakademie Munich, Germany

Ulrich Dopfer joined ADVA in March 2004 and led the group through some key financial initiatives taking on increasing responsibility over time. In 2006 Ulrich moved to Norcross, Georgia, where he is still based today. Prior to his appointment as CFO in January 2015, Ulrich served as vice president of financial planning & analysis and corporate services where he strategically optimized major processes, systems and support infrastructure, enabling ADVA to maintain the right balance between vision and execution. Combining his operational expertise with his vast financial skills and strong leadership style, Ulrich provides ADVA with the ability to flexibly steer the group in a volatile high-growth environment, to ensure profitable growth. In addition to his CFO role, Ulrich was appointed president of the company's North American subsidiary in January 2015, assuming full legal responsibilities for the region. Ulrich's activities at ADVA build on more than 20 years' experience of designing and implementing financial reporting, performance measurements, policies and standards to maintain strong internal controls in corporate roles including positions at ESCADA AG and FJH AG.

Scott St. John

Chief marketing and sales officer (CMSO)
Born in 1969

Bachelor of Arts, economics, Syracuse University, USA

Scott St. John has spent over 25 years in the network technology industry. He has a proven track record of building high performance teams in sales, marketing and customer service, as well as driving strategy to meet overall corporate goals. Scott joined ADVA in 2017, as part of the acquisition of MRV Communications, and was appointed CMSO and a member of the management board in October of 2017. As of late 2018 he is also responsible for the company's services group. Prior to his role at ADVA, Scott was SVP of global sales and service at MRV Communications since 2014, restructuring the sales and service teams and driving adoption of new packet and optical platforms by over 175 customers globally. From 2004 to 2013, he served Overture Networks in senior sales and service leadership roles, delivering nine consecutive years of sales growth. Scott has also held sales leadership positions at Saisei, Larscom and VINA Technologies, as well as sales, marketing and finance roles at Lucent Technologies (now Nokia) and AT&T.

Letter to shareholders

Dear shareholders and friends,

The past financial year was overshadowed by much political and economic turmoil, which also weighed on the financial markets. The US trade dispute with China and Europe has far-reaching consequences. Italy's debt burden and budget dispute with the EU is also causing concern, as is Brexit – or rather the ongoing uncertainty about the outcome – as well as the ECB's reduced bond purchases and, more recently, the yellow-vest controversy in France. In addition, there were a series of stark profit warnings from several corporates, which in turn fueled recession fears. Most of the factors that created uncertainty in the markets over the past year remain relevant and unresolved in 2019.

Stability, continuity and growth

We have kept on course in these turbulent times, remaining disciplined to ensure both stability and continuity. In all four quarters, we were able to increase our revenues sequentially, and our profitability has also developed in a positive direction. In the first half of the year, we purposefully completed the integration of competitor MRV, acquired in 2017, and convinced all relevant MRV customers of the current and future potential of ADVA. In addition to successfully fostering existing customers, we have also won new footprint in all regions. The competitive landscape continued to consolidate in 2018, while our investments in future technologies are increasingly bearing fruit.

Digitization is transforming the world …

The world is undergoing a process of transformation that fundamentally redefines the essence of our society, our coexistence and our economic processes. In all areas of life, digitization is catching on. Business processes are being automated and workplaces becoming smarter (smart robots, smart workspace). Private households use web-based applications to monitor and control parameters in their living rooms such as room temperature and humidity as well as safety functions (connected home). And individual mobility is also undergoing profound changes thanks to autonomous driving. The internet of things (IoT) is growing rapidly and incessantly as more and more items of daily private or industrial use are equipped with sensors to report data to central control units – or enable remote control.

… and networks

The basis for this rapid development is an efficient, global communication network. This network is ubiquitous, reliable and provides access to a wide variety of data and applications in the shortest possible time. The cornerstones are data centers that are equipped with gigantic computing power and huge data storage capacities. In turn, these data centers are connected by powerful, fiber-based communication networks that enable data exchange between sites and provide tremendous transmission bandwidth.

ADVA overview
Management Board

Investment focus is moving to the network edge

For many IoT applications it is important how and where the three critical functions of data processing, data storage and data transmission interwork. The efficient collection, processing and provisioning of data is also crucial to the creation and use of artificial intelligence. In this context, edge computing solutions are needed that require data transmission with short signal propagation time and high security. The investment focus of network operators is therefore moving closer to the edge of the network. This means the market is coming to us: ADVA is optimally positioned at the so-called network edge. All our core competencies are strategically relevant here, and new growth potential is created.

Three strategically important technology pillars

Edge computing solutions, IoT and the fifth generation of mobile technology (5G) require a robust and scalable telecommunications infrastructure with more optical transmission capacity, new models for providing communication services, and more precise network synchronization.

Our recent technology investments address precisely these aspects:

- *Our FSP 3000 platform sets new standards in open optical transmission technology. The platform efficiently delivers automated, scalable data transmission that further reduces the cost of Gigabit transport. The launch of our new TeraFlex™ terminal has the potential to change market momentum in our favor.*
- *Our packet-edge solutions with Ensemble software provide flexible and fast delivery of NFV-based services at the network edge. Several leading network operators have chosen the solution as a key component of their universal customer premise equipment. The commercial implementation is gaining momentum in 2019.*
- *Our synchronization solutions portfolio is technologically ahead of any competitor and is actively used by many of the world's leading network operators. We were able to show above-average revenue growth in 2018 and continue to expect a positive and most importantly very profitable business development.*

Optimism and opportunities

Despite the uncertainty around the development of the global economy, we are very positive about our future. Digitization is changing networks and bringing the investment focus to us. We are technologically well positioned. Our three core competencies are strategically relevant for the transformation of networks – a transformation based on openness, virtualization and security. This creates new growth opportunities.

In addition, we have a loyal, growing global customer base that puts their trust in us and leverages our expanding portfolio in more and more network applications. The number and variety of our customers has never been greater, the distribution of revenue between the regions has never been more balanced, and we currently see no critical dependencies on individual large-scale customers. At the same time, consolidation in our industry has further reduced the number of competitors, further adding to our profile as an innovative telecommunications supplier with a unique blend of innovation and customer focus.

This profile is sharpened by our employees daily. With their knowledge, creativity and dedication, they make ADVA a trusted partner for thousands of satisfied customers worldwide. I thank our dedicated employees for their consistent and valuable achievements. The combination of their diverse knowledge and skills has made ADVA a unique company with bright prospects.

In 2019, we will continue to invest all our energy and creativity in innovative solutions for the benefit of our customers, shareholders and employees.

February 19, 2019

Brian Protiva
Chief executive officer

Supervisory board

Members

ADVA's supervisory board consists of a diverse and international group of seasoned experts in their respective fields:

Nikos Theodosopoulos – chairman

- Chairman since January 9, 2015
- Member since 2014
- Independent member
- Chairman of the compensation and nomination committee
- Member of the audit committee
- Founder and managing member of NT Advisors LLC

Johanna Hey – vice chairwoman

- Vice chairwoman since June 4, 2013
- Member since 2011
- Independent member
- Chairwoman of the audit committee
- Professor for tax law, University of Cologne

Hans-Joachim Grallert – former member

- Member from 2016 until June 13, 2018
- Independent member
- Former member of the compensation and nomination committee
- Prof. em. Dr.-Ing.

Michael Aquino – member

- Member since June 13, 2018
- Independent member
- Member of the compensation and nomination committee
- Technology strategy consultant

Report of the supervisory board

In 2018, the supervisory board once again performed its duties under the law and the company's articles. It carefully and continuously monitored the management board and supported it in all strategic matters. The supervisory board has been directly involved in the early stages of all important strategic decisions of the company. During a total of six ordinary meetings, in which all members of the supervisory board and the members of the management board regularly participated, the management board consistently, promptly and extensively informed the supervisory board about the business situation of the company and the group. In particular, the supervisory board was informed on matters regarding strategic orientation, market development and prospects for growth, as well as on the development of net assets, financial position and profitability, including budgeting, investments, personnel, compliance, internal audit and risk management. The supervisory board extensively discussed all important business issues on the basis of the management board's reports. Any deviations of the actual business development from the group's plans and objectives were thoroughly explained by the management board and reviewed by the supervisory board. The supervisory board gave its approvals to all important decisions, after thorough examination and consultation, where required by law or the company's articles and acting in the best interest of the company and the group. Furthermore, no urgent matters resolutions were passed outside of meetings during the year. Moreover, especially the chairman and the vice chairwoman of the supervisory board maintained regular contact with individual members of the management board outside of scheduled meetings and were kept up-to-date with respect to current business developments, important transactions and forthcoming decisions.

Main management board activities covered and examined by the supervisory board

In 2018, as in the prior year, the supervisory board focused mainly on the business development and strategic direction of the company and the group, particularly its revenue, earnings and headcount development, and ADVA's financial situation. In this context, new opportunities for revenue growth and the development of margins were discussed.

The supervisory board closely monitored and supported the activities of the management board, including discussions on corporate governance. It discussed the group's organization and key business processes with the management board and assured itself of the efficiency of this organization and these processes. The management board submitted to the supervisory board all transactions and decisions requiring approval according to the company's articles. The supervisory board approved all such transactions and decisions.

Committees

In order to perform its tasks efficiently, the supervisory board continued to maintain two committees during 2018, the audit committee and the compensation and nomination committee. Members of the audit committee were Johanna Hey (chairwoman) and Nikos Theodosopoulos, members of the compensation and nomination committee were Nikos Theodosopoulos (chairman) as well as, from January 1 until June 13, 2018 Hans-Joachim Grallert, and since July 17, 2018, Michael Aquino.

The audit committee held five meetings during the reporting period, in which all members regularly participated. In addition to reviewing the consolidated annual and three quarterly financial statements and group management reports as well as the company's annual financial statements and management report, the audit committee discussed the financial position and performance of the group, the appointment of the external auditor, the audit scope for 2018, the development of tax positions and risks, internal audit activities, as well as the effectiveness of the internal controls related to financial reporting and of the risk management system.

The compensation and nomination committee sat two times during the past year. The committee's discussions focused in particular on the remuneration and the contract extensions of the chief officers.

Reports on the work of the supervisory board committees were regularly presented and discussed during the subsequent supervisory board plenary meeting.

Corporate Governance Code

The supervisory board welcomes the German Corporate Governance Code and supports its objectives. The supervisory board has agreed to comply with most of the recommendations and proposals of the Corporate Governance Code within the ADVA organization. In its meeting on April 24, 2018, the management board and supervisory board resolved and approved an update to the declaration of conformity issued on November 15, 2017. In its meeting on November 14, 2018, the supervisory board discussed the deviations from the Code and jointly issued the regularly scheduled update on the declaration of compliance in accordance with section 161 of the German Stock Corporation Law (Aktiengesetz, AktG). Both the updated statement of April 24, 2018 and the yearly statement of November 14, 2018 are made permanently available to shareholders on the company's website.

Annual financial statements and management reports

ADVA's consolidated annual financial statements for the year ended December 31, 2018, and ADVA Optical Networking SE's annual financial statements for the year ended December 31, 2018, as well as the group management report and the management report of ADVA Optical Networking SE for the fiscal year 2018 were audited by the company's appointed auditor for 2018, PricewaterhouseCoopers GmbH Wirtschaftsprüfungsgesellschaft, Munich, who issued unqualified audit opinions. Pursuant to section 315e of the German Commercial Code (Handelsgesetzbuch, HGB), the consolidated annual financial statements have been prepared according to International Financial Reporting Standards (IFRS) as enacted in the EU. All management letter points issued by the auditor were taken up, discussed with the management board, and their consideration was ensured.

All relevant accounting documents, financial reports and audit reports were submitted to the supervisory board members prior to the meeting of the supervisory board dealing with the company's and group's 2018 financial statements. On February 14 and 18, 2019, these documents were discussed and examined in detail jointly by the audit committee and the auditor and in consideration of the auditor's long-form report. The audit committee reported its findings to the entire supervisory board in its meeting on February 19, 2019. Furthermore, the auditor, who was present in all three meetings, reported on the material results of the audit, explained net assets, the financial position and the results of operations of the company and the group, and was available to answer additional questions from the members of the supervisory board.

In view and consideration of these audit reports and on the basis of the additional information provided by the auditor, the supervisory board discussed and examined in detail the financial statements and management reports in its meeting on February 19, 2019. It unanimously approved ADVA Optical Networking SE's annual financial statements and management report, as well as ADVA's consolidated annual financial statements and group management report. The annual financial statements of ADVA Optical Networking SE for the fiscal year 2018 are thereby adopted.

Changes within the management and supervisory boards

On June 13, 2018, Hans-Joachim Grallert resigned from the supervisory board. The supervisory board thanked Hans-Joachim Grallert for his valued contributions. The annual general meeting held on June 13, 2018 elected Michael Aquino as his successor as member of the supervisory board until the end of the annual general meeting that will decide upon his discharge for the financial year 2020.

In its meeting on February 19, 2019, the supervisory Board approved the proposals of the compensation and nomination committee and resolved to extend the terms of appointment of Brian Protiva, Christoph Glingener, Ulrich Dopfer and Scott St. John as members of the management board until December 31, 2020. It was agreed that corresponding contractual provisions would be superimposed with the individual members of the management board in writing.

The supervisory board would like to express its appreciation for the personal dedication, performance and the ongoing commitment of the management board and all employees of the company and the group during 2018.

February 19, 2019

On behalf of the supervisory board:

Nikos Theodosopoulos
Chairman of the supervisory board

ADVA stock

After a challenging year in 2017, the share price initially continued to decline in the first quarter of 2018. As a result, ADVA dropped out of the TecDAX index in March 2018. Particularly at the beginning of the financial year, the challenge was to regain investor confidence following the ad hoc announcement in Q3 2017. After increasing revenue and profitability for three quarters in a row, the share price also reacted very positively. ADVA was able to convince the capital market of the successful integration of MRV and the successful execution of the initiated consolidation measures during the current fiscal year. In addition, ADVA has refinanced the bridge loan related to the acquisition of MRV through a long-term syndicated loan, underlying the confidence of the banks in ADVA's corporate development. In Q4 the share price declined again, due to the intense tech sell-off at the US technology exchange NASDAQ. The share price traded at just over EUR 6 on December 31, 2018. ADVA ended the stock market year 2018 with a +3.64% premium but managed to finish only slightly above the 2017 level, despite an interim share price gain of over 30%.

Steven Williams

"Our edge technology is empowering customers to rapidly respond to a changing world. Together we're taking the next major step in digital transformation."

On December 31, 2018, the company's nominal share capital totaled EUR 49,930,955, an increase of EUR 195,406 compared to December 31, 2017. The higher share capital is fully attributable to the issuance of ordinary shares from conditional capital following the exercise of employee options throughout 2018. ADVA's shareholder structure at the end of 2018 looked as follows: free float equaled 64.76%, including 0.8% of outstanding ADVA stock held directly by members of the management and supervisory board. In addition to the EGORA Group, which held 14.99% of the shares as of December 31, 2018, the other major shareholder Teleios Capital Partners repeatedly increased its shares in ADVA and held a stake of more than 20.0% at the end of the year (voting rights announcement as of 19 September, 2018: 20.25%). Compared to the end of 2017, the free float of 69.99% decreased to 64.76%*. During the year, the company did not utilize the share buyback authorized at the Annual Shareholders' Meetings in June 2010 and May 2012.

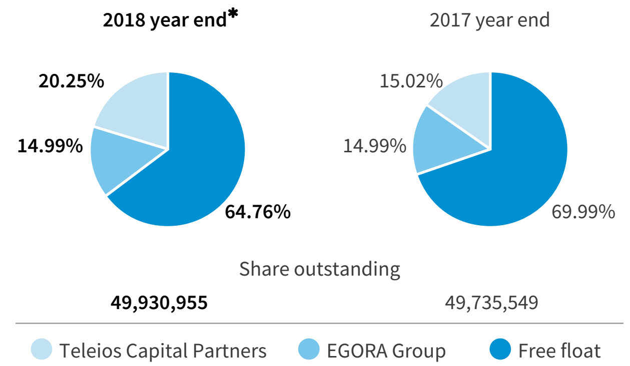
* Capital shares refer to the total number of voting rights at the respective notification date. A change in the total number of voting rights after the notification date was not taken into account.

Stock information*

Trade name	ISIN DE0005103006/WKN 510300
Symbol	ADV
Exchange	Prime Standard Segment Frankfurt Stock Exchange
Sector	Technology
Industry	Communications Technology
Number of shares outstanding at year-end 2016	49,930,955
2017 high/low price	EUR 8.13/EUR 4,99
2017 year-end price	EUR 6.26
2017 year-end market capitalization	EUR 312.57 million
2016 year-end price	EUR 6.04
2017 share price performance	+3.64%

* Price information is based on Xetra closing prices.

Shareholder structure



* Capital shares refer to the total number of voting rights at the respective notification date. A change in the total number of voting rights after the notification date was not taken into account.

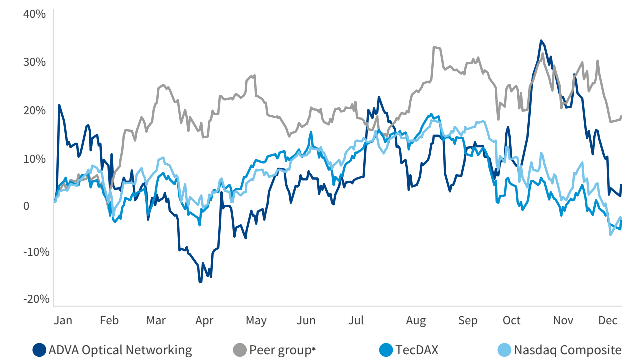
ADVA started the year 2018 with a share price at just over EUR 6. Following record revenues in 2016, the company published disappointing results in 2017. As expected, the share price continued its downward trend, reaching its low at the beginning of April, just below EUR 5. However, this below-average performance was similar with other European equities, which were impacted by anticipation of a more aggressive ECB rate hike, US trade disputes, weaker European economic data and political risks.

With the publication of the results for the first quarter, the share price began to recover. The company was able to increase its revenue compared to the previous quarter and met guidance. The outlook for Q2 was more optimistic again, which led to the stock continuing its positive development. Q2 results were also within the guidance and the outlook for Q3 was at the same level as the previous year prior to the ad hoc announcement of August 2017. Although the share price initially boosted with that development, it decreased again at the end of July and only developed moderately further on. With Q3 revenue rising for the fourth consecutive quarter and an outlook above the previous year's guidance, the stock performed with a sharp increase that peaked at over EUR 8 in November. Although the share price did not reach the level of more than EUR 10 of summer 2017, this development reflected the regained confidence of investors in ADVA's corporate development. In addition, ADVA refinanced the short-term bridge loan in the connection with the acquisition of MRV Communications, Inc. through a long-term syndicated loan.

After the US technology stocks had rallied in the course of 2018, the NASDAQ pulled back sharply in mid-November, particularly due to the weakness of the US tech giants. This development also had consequences for the ADVA stock, which had then dropped significantly by the end of the year and closed at just over EUR 6. The share thus developed in 2018 +3.64%. With a market capitalization of EUR 312.57 million as of December 31, 2018, ADVA was higher valued than in the previous year, but this level is still relatively low.

Price development 2018 comparison

(in %, indexed)



* Peer group data are calculated with the arithmetic average of Ciena, Cisco, and Infinera stock prices

Investor relations review

Investor relations work was driven by the following priorities in 2018:

- Rebuilding confidence in the investor community based on the company's sequential growth and increasing profitability
- Intensive investor communications through conferences with focus on Europe and the US
- Industry consolidation and increasing relevance of all ADVA technologies

The digitization of ecosystems is progressing across the globe and requires a rapid and sustainable expansion of network infrastructure. The preparation for the fifth generation of mobile technology (5G), the internet of things (IoT) and the development and use of artificial intelligence (AI) are driving the modernization and expansion of networks. ADVA's solution portfolio based on optical transmission technology, network access solutions with virtualization and synchronization technology is exclusively based on technologies that are strategically important for the transformation of networks.

Despite the sustained increase in demand for modern network technology and its economic importance, the network equipment industry continues to face a challenging environment determined by high R&D expenditures, short innovation cycles, competitive pressure and fierce price negotiations. However, the industry is experiencing positive market growth in various segments and geographies.

In order to meet investors' demand for information on current market developments and their impact on ADVA, the company has continued its investor relations work at a very high level.

A total of two roadshows (2017: six) were held in Chicago and Minneapolis, as well as over 190 one-on-one meetings (2017: 270). ADVA presented itself to institutional investors at a total of 11 investor conferences (2017: 14), including cross-industry conferences and technology-focused events. These conferences were organized by Berenberg / Goldman Sachs, Cowen, Deutsche Bank, Dougherty & Company, Jefferies, Liolios, Needham and Deutsche Börse (German stock exchange),

In addition, with a total of 52 press releases, three quarterly reports and regular conference calls, the financial community was kept informed about any significant developments within ADVA. Furthermore, throughout the year, the company continued to provide comprehensive and up-to-date information relevant to the financial community on the investor relations pages of its website at www.advaoptical.com, including full transcripts of archived conference calls.

At the end of 2018, five financial analysts (end of 2017: five) provided research coverage of ADVA's stock.

Financial analyst coverage

(as of December 31, 2018)

Institution	Financial Analyst Name	Location
FMR Frankfurt Main Research AG	Felix Lutz	Frankfurt am Main, Germany
Deutsche Bank	Rob Sanders	London, England
Hauck & Aufhäuser Research	Robin Brass	Hamburg, Germany
LBBW	Mirko Maier	Stuttgart, Germany
Northland Capital Markets	Tim Savageaux	Minneapolis, USA

Overall trading liquidity in ADVA's shares decreased substantially from 2017 levels. This was mainly due to the company's exclusion from the TecDAX index. Investor interest in the network equipment industry, however, continues to be very high in light of the digitization of society and the dynamics of the internet economy (cloud). The average Xetra trading volume was at 203 thousand shares per day during 2018, following 580 thousand shares per day during the previous year. Due to the increasing position of the hedge fund Teleios Capital Partners in the ADVA stock, the free float decreased to levels of approximately 65%.

The annual shareholders' meeting took place on June 13, 2018, in Meiningen, Germany. All items on the agenda were approved by a majority, including the election of Michael Aquino as a new member of the supervisory board. Furthermore, the annual shareholders' meeting appointed PricewaterhouseCoopers GmbH Wirtschaftsprüfungsgesellschaft as the auditor for the 2018 financial results.

Investor relations contact

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Business overview

ADVA develops open networking technology that forms the building blocks of a shared digital future and empowers networks across the globe.

Technology

ADVA develops, manufactures and sells networking solutions for a modern telecommunication infrastructure. Its products are based on three core areas of expertise: fiber-optic transmission technology, Ethernet-based packet networking with intelligent software for virtualization and network management, and solutions for precise timing and synchronization of networks.

Optical networking

Fiber is the optimum physical medium to transmit large amounts of data over long distances. The bandwidth-over-distance capabilities of fiber by far exceed those of any other physical medium such as copper or wireless technologies. Therefore, fiber-optic transport is the unchallenged foundation for all high-speed networks. ADVA's optical transmission solutions are based on wavelength division multiplexing (WDM) technology. With WDM, multiple data streams are transmitted simultaneously over a single optical fiber by assigning each stream to a different wavelength (i.e. color) of laser light. Every wavelength (more than 100 in total) can carry a different application such as voice, video, data or storage traffic. Combining (i.e., multiplexing) these wavelengths at one end of the fiber, transmitting them over distance and then separating (i.e., de-multiplexing) them at the far end multiplies the fiber capacity and makes transmission more efficient. WDM supports all data protocols and transmission speeds and is a natural foundation for all high-capacity networks.

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Carrier Ethernet and virtualization

Ethernet is the dominant data-link protocol for today's networks supporting a multitude of communication applications. ADVA provides Ethernet-optimized transmission solutions for fiber-based networks. Carrier Ethernet is often used at the network edge supporting several important applications. Network operators use the technology to backhaul traffic from mobile base stations and to connect their enterprise customers. Over the years, Ethernet has evolved to be the key protocol used to carry applications in high-speed optical networks for data backhaul and the interconnection of routers.

The importance of software in networking technology is increasing rapidly. On the one hand, network operation is automated by means of intelligent software, which increases user friendliness and simplifies network control and maintenance. On the other hand, more and more network functions are virtualized (network function virtualization, NFV). With NFV, the tight coupling between hardware and software in network elements is dissolved, and individual network functions can be developed and provided independently of the underlying hardware. The Ensemble software solutions resulting from the acquisition of Overture in 2016 are now leading the way in NFV infrastructure applications.

Synchronization

Reference sources that deliver stable frequency and time-of-day information are crucial to the effective transmission of digital signals. Especially in mobile networks, the availability of highly accurate synchronization and timing information is crucial for best end-user experience. With a complete end-to-end solution portfolio sold under the Oscilloquartz brand, ADVA can offer a smooth evolution across multiple generations of synchronization technologies.

Technologies for a digital future

ADVA's three technology pillars are fundamental to the rapidly advancing digitalization of ecosystems around the world. Optical networking technology with WDM provides the scalable transmission capacity needed to handle bandwidth growth. Carrier Ethernet with NFV allows the flexible and fast deployment of new communication services, and the synchronization technology ensures maximum performance in the network.

ADVA creates innovative networking solutions from inception through manufacturing and into service. The following paragraphs describe important market dynamics that drive growth for the group's business.

Market, target customers and growth drivers

The rapid digitalization of society and ecosystems is putting a lot of pressure on communication networks worldwide. It is generating an ever-growing demand for more universally available bandwidth, faster provisioning of specialized communication services and high-precision time and frequency synchronization in distributed systems.

ADVA's technologies are strategically important to the necessary network transformation, and there is an increasing number of applications for optical transmission technology, physical and virtualized packet-edge access solutions and high-performance synchronization technologies.

The following briefly describes the key applications, target groups and growth drivers in ADVA's addressable market.

Data center interconnect for large enterprises

In a digitally networked world, enterprises depend more than ever on the integrity of their data and the availability of digital resources. There is a growing need to develop more reliable and efficient IT infrastructures, which not only protect against data loss, but also ensure that all processes run smoothly and at all locations. The loss of mission-critical information is a big threat to enterprises. System failures can result in idle staff, damage to reputation and, ultimately, lower revenues.

Due to the criticality of data and application availability, many large enterprises, research and educational institutions as well as health care providers have gone down the path of operating their own data centers connected via private fiber optic networks. Such private enterprise networks purely serve the business processes of an individual company or organization and offer a high degree of security and control. The network operation is either in the hands of the in-house IT department, or a specialized IT or communication service provider. The private IT infrastructure (private cloud) is often complemented by a partial outsourcing of less critical functions and data in external data centers, operated by a third party (public cloud). The combined use of private and public cloud solutions is called hybrid cloud. This approach is gaining a lot of traction and will continue to spread rapidly in the corporate world.

ADVA has over 20 years of experience in the development and deployment of innovative transmission technology for data center interconnect. Many major companies from the so-called Fortune 500 league rely on ADVA's transmission technology for their business continuity and disaster recovery applications. ADVA offers a highly innovative product feature set in this market segment. The ADVA FSP 3000 supports native transmission for all data center protocols, guarantees low latency and provides additional security through the company's ConnectGuard™ encryption technology. Furthermore, ADVA has built a strong partner landscape supporting the go-to-market process.

Data center interconnect for internet content providers

Internet content providers (ICPs) are companies whose principal business is the creation and dissemination of digital content. The ICP community includes, for example, large internet companies such as Apple, Amazon, Facebook, Google, HP, IBM and Microsoft. These companies operate data centers of enormous proportions and are often referred to as a "hyperscale" or "cloud-scale" operators. ICP data centers contain huge server farms. The main asset of an ICP is its digital content and the associated services.

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The ICP community is focused on innovation, has much experience in developing software and a pronounced do-it-yourself mentality. ICPs' main objective is optimizing costs and strengthening the performance of their portfolios. For wide-area connections between their data center sites, they often still resort to leased lines from CSPs. However, there is a trend toward more and more scenarios where ICPs rent dark fiber and equip it with their own transmission technology. Because of their size and purchasing power, ICPs are not only a relatively new, but also interesting target group in the market for optical transmission equipment, promising high growth potential.

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ADVA, thanks to its extensive experience in the field of data center interconnect for enterprise networks, offers many compelling product features and solutions for DCI applications (see previous section). Furthermore, the company developed a new version of the FSP 3000 platform specialized for the ICP community. The ADVA FSP 3000 CloudConnect™ further enhances fiber utilization and takes key performance parameters such as space and power efficiency to a new level. Thus the platform delivers a highly compelling feature set for interconnecting hyperscale data centers in the ICP. ADVA's highly agile and innovative corporate culture makes the company an attractive partner for the ICP target group.

Transforming carrier infrastructure

Carriers are companies that are in the business of building and operating large-scale networks that they use to offer communication services to end-users or other CSPs. Besides the demand from businesses and ICPs for data center interconnect capacity, it is foremost the increasing bandwidth demand of private households that challenges carriers, increasing the pressure to expand their network infrastructure. Drivers of bandwidth growth are mainly mobile devices, as well as the increasing number of networked devices through the internet of things (IoT). Industry analyst firm Gartner forecasts that 14.2 billion connected things will be in use in 2019, and that the total will reach 25 billion by 2021, producing immense volume of data. Carriers have a key role to play in digitizing ecosystems.

In addition to industrial use cases, it is the rapid growth of video-on-demand offerings from so-called "over-the-top" providers like Netflix or Amazon Prime that is creating huge traffic loads in carrier networks. In order to guarantee good signal quality, carriers need to deliver several Mbit/s of bandwidth per household. Building and operating a network that delivers such capacity is no trivial task. Moreover, due to the adoption of higher resolution video standards and 3D technology, bandwidth demand will continue to grow relentlessly for the foreseeable future. The first examples of so-called gigabit cities have emerged, where the available bandwidth per household reaches 1Gbit/s. This is more than a factor of 20 higher than the bandwidth required for a traditional broadband service. Hence, a network node that serves households in a gigabit city handles 20 times the bandwidth of a comparable site in a traditional broadband network.

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There are several ways for service providers to deliver broadband connectivity to their customers. Traditional telecommunications companies often rely on digital subscriber line (DSL) technology to increase the capacity of their access lines (i.e., twisted pairs of copper wires), which are typically available to every household. Coaxial cables are a good alternative, typically owned by cable TV companies that are expanding their offerings to become multiple service operators (MSOs). New initiatives for fiber-to-the-home (FTTH) or fiber-to-the-building (FTTB) are rolling out, providing the ultimate bandwidth pipe. Last but not least, there are wireless technologies in the mix. Currently the fourth generation (4G) of mobile network technology is being deployed, based on the so-called Long Term Evolution (LTE) standards. The fifth generation (5G) is already under development and will be used commercially for the first time in 2019 (for example in South Korea). All these access technologies deliver significantly higher bandwidth per end user than legacy technology.

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For carriers, the challenge is to provide market competitive connectivity to as many customers as possible at the lowest possible cost. That means making good use of existing infrastructure, especially in the access part of the network, and intelligent investment in new technology to support growth and emerging applications.

ADVA helps carriers to simplify and automate their networks and build a scalable network infrastructure that is future proof. By deploying the group's networking solutions, carriers can combine various traffic streams from different access technologies onto a single transport platform. Backhaul for copper, coax, fiber and wireless access technologies on a single platform eliminates the costly operation of parallel systems. In addition, ADVA offers with the FSP 3000 one of the most scalable platforms on the market, allowing seamless data transport from the customer premises to the core of the network. Thus, carriers can bypass some of the small access nodes, eliminating the expense of operating these locations.

The ability to deliver more bandwidth to more customers from fewer sites located farther back in the network enables operators to streamline their networks while simultaneously improving the end-user experience. Energy-hungry devices, which are needed for data processing, can be concentrated in fewer network locations. This is important for so-called edge-computing solutions and leads to a network architecture that is more energy-efficient and easier to operate.

Hannah Eckinger
Marcello Forti

"Our team and our technology have helped shape the networks of today. But that's just the beginning. The next stage of our journey will touch and enhance every aspect of people's lives. "

Transforming the network edge

Serving residential customers is, in most regions around the world, a highly competitive business with low margins for service providers. The providers are therefore keen to offer telecommunications services to business customers and provide industrial multi-cloud solutions. Serving enterprise customers is typically more lucrative as this clientele has more stringent requirements for quality of service, network performance, network availability and security. The CSP can charge a premium for these quality attributes but needs to back the service offerings with service level agreements.

In a digital framework, what companies need above all is high data security and speed. It is secondary, whether it is a transfer of data between two company locations, an application for the company's customers or an application in the cloud. As a result, companies will pay more attention to the location of their data and connections in the future.

Also, for the internet of things (IoT) it is important how and where the three critical functions of data processing, storage and transmission work together. The resulting edge computing solutions generate their added value as much as possible by optimizing two parameters: the amount of data to be processed, and the proximity to the place where the data is collected and needed.

CSPs are in a perfect position to capitalize on the trend towards more localized functions and use their geographic footprint to their competitive advantage by creating tailormade solutions with low signal latency and high security. Thus, the investment focus for carriers is moving to the network edge.

At the network edge, many operators deploy packet-based Carrier Ethernet (CE) technology as a unified, data-optimized transmission solution in their infrastructure. Business customers appreciate the simplicity and efficiency of the CE technology and already know the Ethernet protocol from their local area networks. For services that address functions in higher network layers, however, network operators often rely on so-called routers and switches.

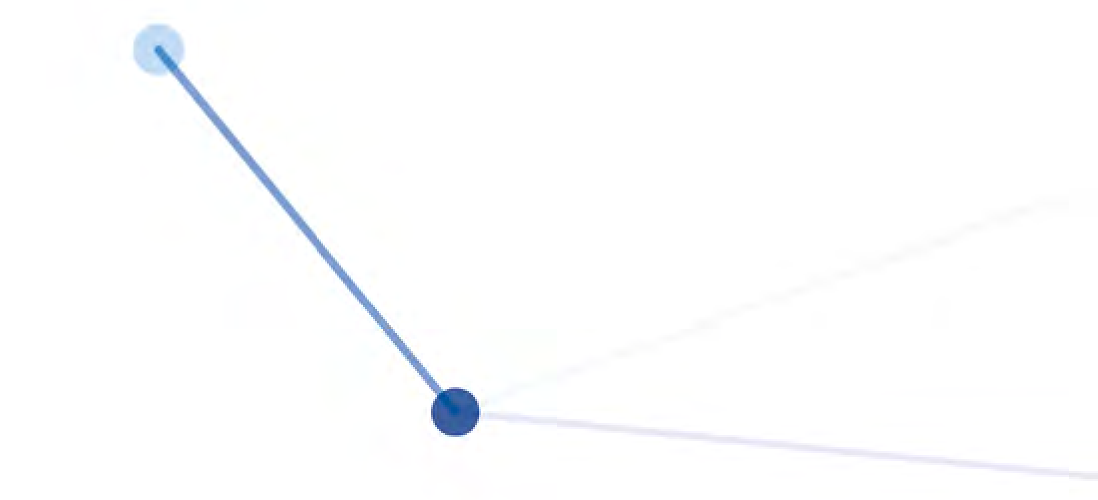
Recently, the adoption of NFV has changed the market at the network edge, and the separation between the two technology segments is disappearing. Through the virtualization of network functions, the creation of new services becomes a software-centric process, and new value-added services in higher network layers can easily be deployed over CE connections. This allows network operators to reduce the complexity of application-specific hardware in their portfolio and to offer new business models through a universal, programmable infrastructure, thus generating additional revenues.

In addition to connecting business customers, CSPs also use fiber-based CE solutions to backhaul traffic from mobile base stations. The success of smart phones and the associated high-speed mobile services created a bandwidth explosion. Mobile operators are now challenged to provide significantly higher bandwidth via their mobile networks without compromise on geographic coverage. Operators consequently upgrade their mobile networks and introduced 4G (LTE) technology. The next upgrade via LTE-Advanced (4.5G) is already being implemented, and the introduction of the fifth generation (5G) is expected for 2020. While the new mobile technologies allow the delivery of more bandwidth over the air interface to the mobile devices, operators also need to solve the backhaul challenge from base stations to their core networks. Higher-speed backhaul today is generally implemented via fiber and optimized for data transmission supporting all the different applications. In the context of newer 5G technologies, not only the bandwidth in the networks increases, but also the number of antennas multiplies. This densification of radio heads requires a significant investment in the fiber optic network and 5G antenna technology as well as much more precise time and frequency synchronization throughout the network. The build-out of mobile broadband networks drives the demand for a new generation of fiber-based CE solutions that deliver and assure high data throughput and accurate timing information.

In summary, the trend towards enterprise multi-cloud solutions, IoT and corresponding edge computing solutions, as well as the increase in antenna density in 5G mobile networks, are creating new market dynamics and opportunities at the network edge.

ADVA offers a highly competitive solution set in this space. The company's FSP 150 product portfolio empowers service providers to provide their customers with intelligent solutions quickly and efficiently in all relevant application scenarios. The portfolio allows the provision of virtual network functions and the definition of a universal network termination. In combination with ADVA's Ensemble software solutions, network functions can be reliably hosted and orchestrated. In mobile backhaul applications the ADVA FSP 150 excels by delivering and assuring precise synchronization information in addition to powerful data plane performance.

ADVA overview
Business overview



Products

ADVA's portfolio strategy is built on a tripod of technologies:

- Optical networking technology
- Packet-edge solutions with NFV
- Network synchronization

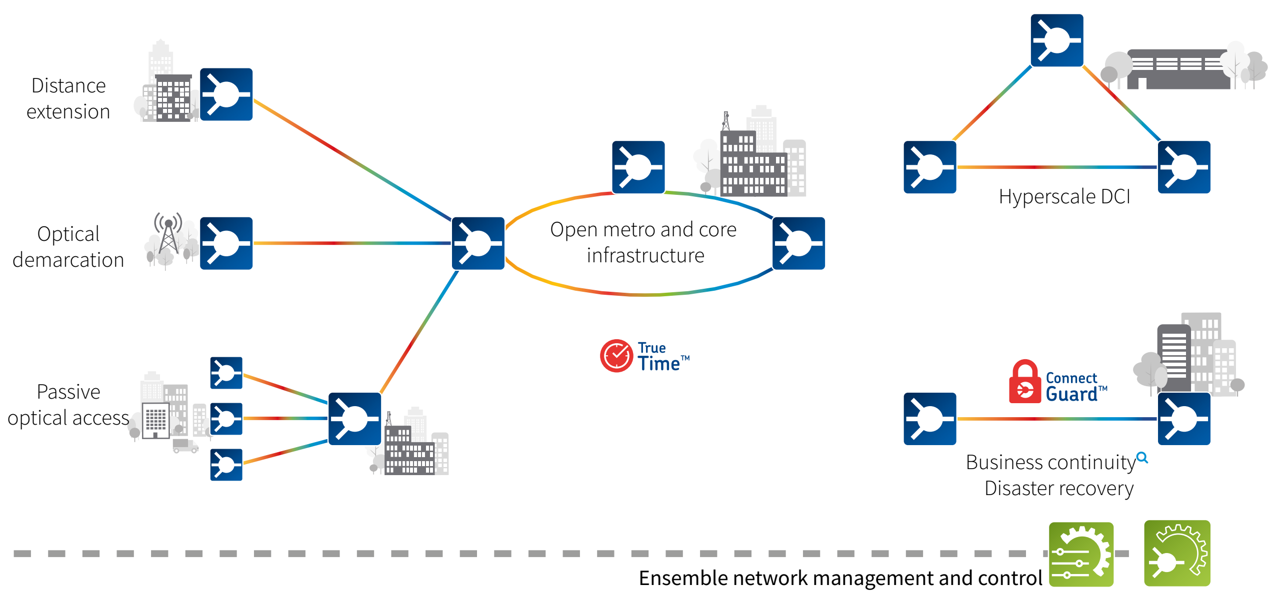
Open optical transport

The ADVA FSP 3000 is a WDM-based optical networking system designed to maximize the bandwidth and service flexibility of access, metro and core networks. The modular design is highly scalable and enables high levels of network automation.

The platform impresses on the one hand with its high-performance terminals, which bundle data streams and generate transmission rates of up to 600Gbit/s per wavelength. On the other hand, through its open optical line system (OLS), which can be optimized for access, metro and long-haul applications. The combination of the platform's latest generation terminal and OLS supports transmission capacities of more than 50Tbit/s per fiber.

The ADVA FSP 3000 – The open optical transport solution

The following network diagram illustrates the application space of the ADVA FSP 3000:



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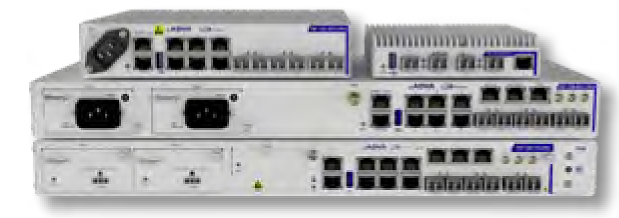
Packet-edge with NFV

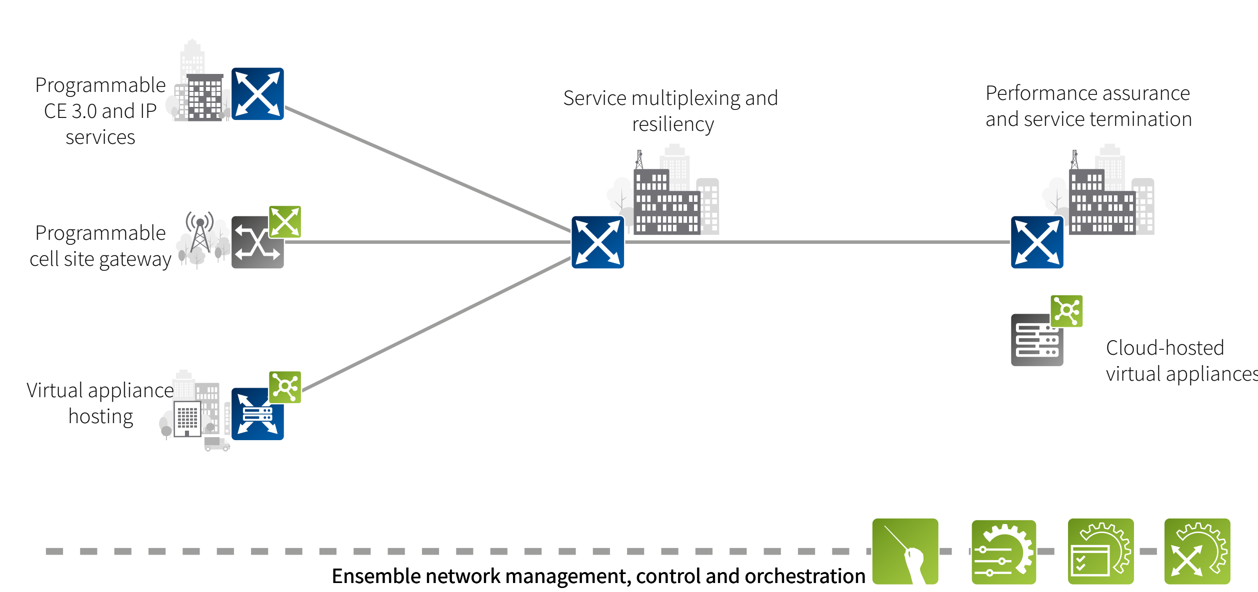
The ADVA FSP 150 product family is a programmable, universal networking solution based on Carrier Ethernet technology for the so-called network edge. At the network edge carriers worry less about the total amount of data to be transferred, but rather about a radical simplification of the logistical processes. Network operators strive to make delivery and protection of communications services faster and more flexible.

With the introduction of NFV, more and more network functions will be realized as software applications, independent of application-centric hardware. These software applications can then be deployed centrally in a data center, or alternatively can be installed on a network termination device with integrated server functionality, such as the ADVA FSP 150 ProVM. With the Ensemble software framework, ADVA provides an NFV-optimized infrastructure (NFVi) that enables network operators to quickly and efficiently generate, deploy and administer value-added services, regardless of specific hardware. For the first time, functions from higher network levels can now also be mapped onto the ADVA portfolio. As a result, the addressable application space for the company is once again significantly expanded.



The ADVA FSP 150 – The empowered network edge

The following network diagram illustrates the application space for the ADVA FSP 150 family:



Network synchronization

Under the Oscilloquartz brand, ADVA develops, manufactures and distributes a broad product portfolio for the synchronization of distributed systems and network elements. This portfolio covers all necessary functions and includes:

- Highly accurate, self-contained frequency sources (e.g., cesium clocks)
- Synchronization supply units (SSU)
- End-to-end solutions to synchronize 3G, 4G (LTE and LTE-Advanced) and 5G networks via a packet-based infrastructure
- Global navigation satellite system (GNSS) receivers
- Network timing protocol (NTP) solutions (standalone or integrated in SSUs)
- Network management solutions

In addition to the constantly increasing demands on the precision of time and frequency, there is also a trend towards miniaturization. Also in this area, Oscilloquartz has an industry-leading portfolio, including a unique plug-in reference device in the so-called SFP form factor.

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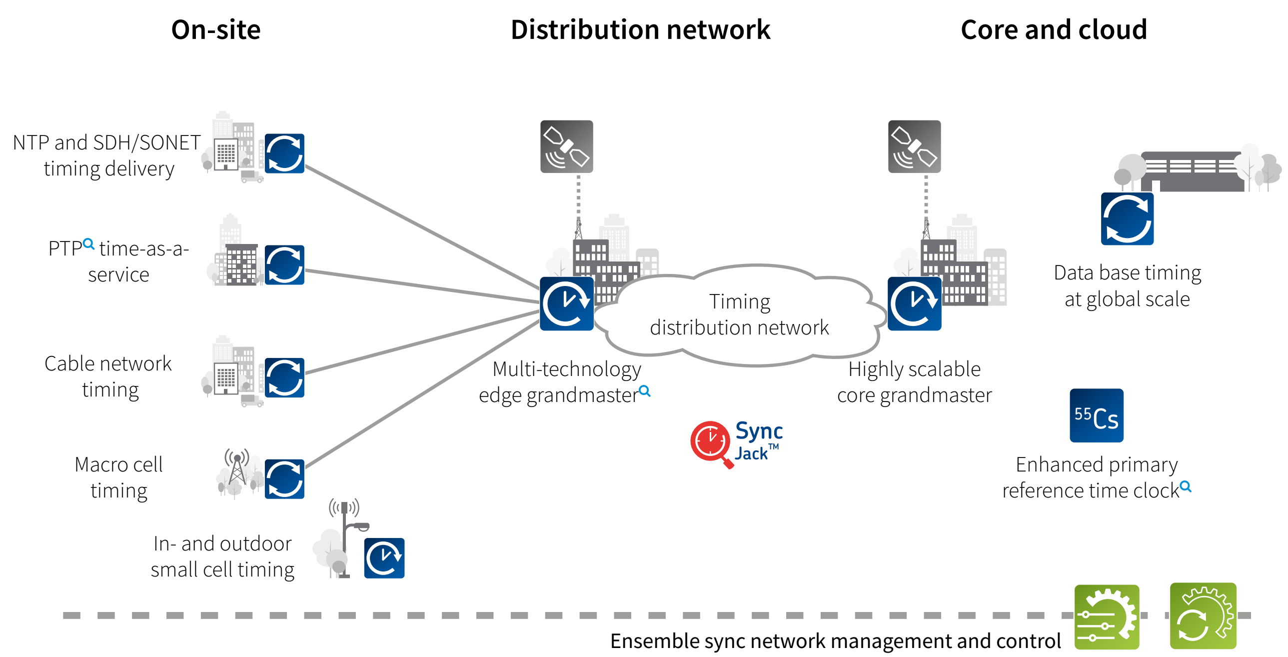
Oscilloquartz - Precision timing

The following graphic illustrates several use cases for the Oscilloquartz portfolio:



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Professional services

In addition to open and programmable networking technology, ADVA offers a variety of services that help the company's customers plan, operate and maintain their networks. This service portfolio includes a network operation center (NOC) from which experts handle network operations for customers.

Regions, sales and marketing

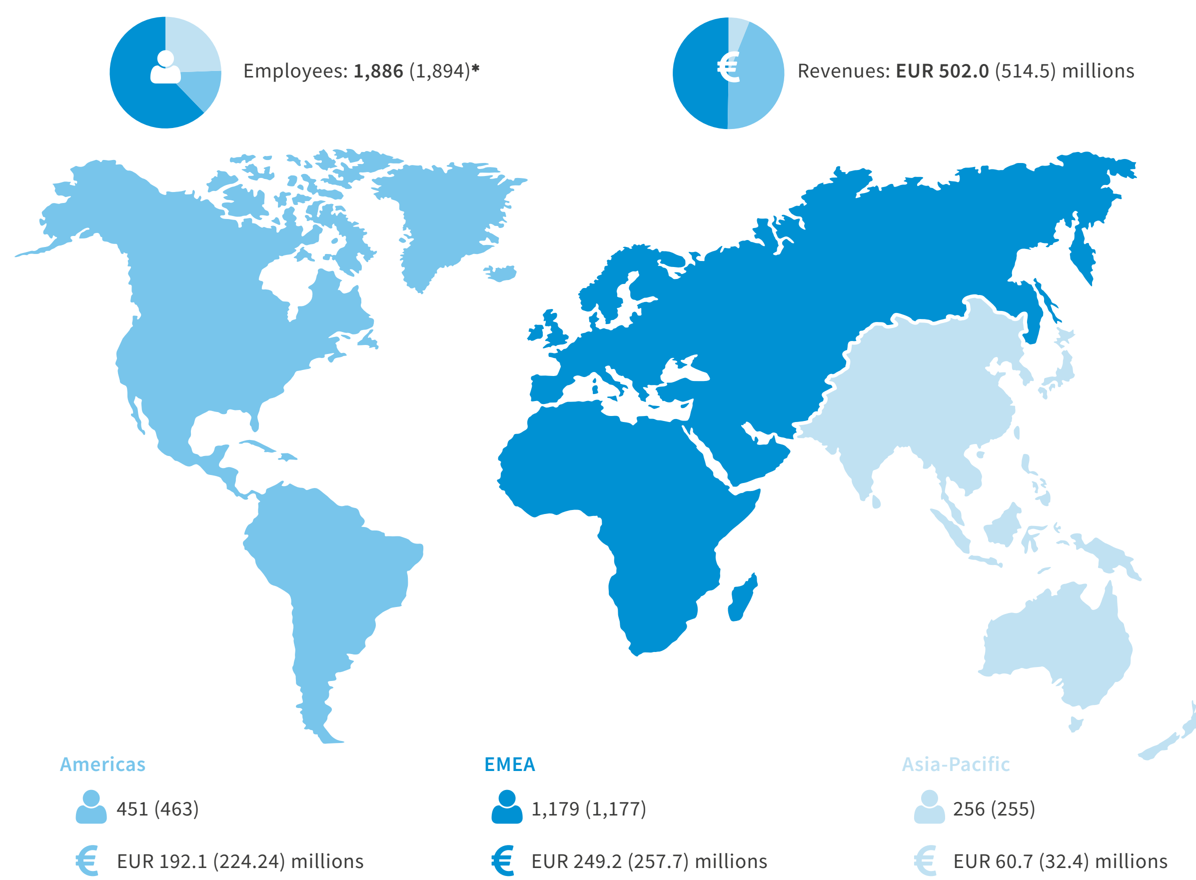
ADVA sells its products to a broad customer base worldwide, either through distribution partners or its own direct sales force. In 2018, the company successfully developed its worldwide customer base, which was significantly enlarged by the acquisition of MRV in 2017, and also won new customers in all regions.

Regions

The EMEA region covers Europe, the Middle East and Africa. In this region, ADVA has a very balanced mix of customers of various sizes and can rely on a powerful network of value-added reseller partners to support the sales of the area. In 2018 EMEA was again the strongest region of the company. Year-over-year EMEA revenues declined slightly. This is primarily due to slightly weaker sales in some countries outside Central Europe. In Central Europe, on the other hand, business continued to develop very positively and grew compared to 2017.

The Americas region covers North America and Latin America. In 2018, America was the second strongest revenue-generating region behind EMEA. Many of the world's largest ICPs are US-based and represent additional revenue potential. ADVA is well positioned in this region.

The Asia-Pacific region followed in third place. APAC includes Australia, New Zealand, Greater China, India, Japan and Southeast Asia. With the acquisition of MRV in 2017, the number of customers in this region has grown significantly and there is now more business with larger accounts that guarantee sustainable and recurring revenues. The APAC region now accounts for more than 10% of total sales.



*Total numbers at year-end 2018 (2017 in brackets)

Sales

ADVA continues to employ a well-balanced sales distribution strategy to maximize customer reach around the world:

DIRECT SALES

The group continues to focus on its direct-touch initiative as well as its direct sales force to win new customers. Establishing direct contact with enterprises and carriers enables ADVA to work more closely with these customers and better understand their specific requirements, which in turn helps to develop the right products and solutions. A direct sales approach is required in particular to address ICPs and strategically important communication service providers.

PARTNER SALES

Sales partners of ADVA include global system integrators such as IBM and Dell, OEM partners such as Fujitsu Network Communications (FNC) and so-called value-added resellers (VARs). Especially in the case of large enterprise networks and carriers, the company works closely with the sales partners during the planning and consulting phase and is intensively involved in the development of an optimal solution for the customer. Technical support after commissioning is generally performed by the partners. ADVA's Partner Ecosphere Program (PEP) ensures that sales partners have intensive training courses for their staff, quick and easy access to equipment engineering and high-quality support for projects.

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Marketing

Direct-touch efforts are proactively supported by the marketing team to build the ADVA brand and to expand visibility of the entire product portfolio. Specific marketing activities include regular participation in tradeshows and conferences, tactical online advertising, news coverage and bylined articles in trade publications. ADVA supports co-marketing efforts with its partners and delivers regular e-newsletter to customers and partners. The group also maintains a dynamic and active online presence, including an influential, popular blog and social media outreach on multiple platforms.

In addition, ADVA has continued to engage in marketing alliances with various global network solution providers. Of particular importance are the numerous interoperability tests, especially in the field of NFV, which ADVA is conducting with its technology partners in order to demonstrate interoperability between different systems. In the area of NFV, the company has established a global network of technology partners around its Harmony program to ensure the seamless operation of virtualized network functions.

ADVA's brand promise can be summarized by three headlines: "Innovation," "Speed for customers" and "Trusted partner." The combination of these three elements makes ADVA a unique and differentiated player in the industry.

DevOps

Organizational setup

ADVA takes an advanced approach to development and operations. In order to further optimize product quality, manufacturability and time to market, these traditionally separate areas are tightly integrated with cross-functional teams working closely across the entire system. DevOps and the business lifecycle (BLC) organization form the two main units in the organizational setup.

The DevOps team covers products from cradle to the grave. Its goal is to ensure consistently high quality and to routinely deliver the right product to the customer in the shortest possible time.

The BLC organization is ADVA's move into next-generation, automated manufacturing, supply chain management, sales and operations planning (S&OP), logistics and reverse logistics.

A third unit, the Advanced Technology Team, continues to identify new areas of innovation. It explores research possibilities and potential avenues for feasibility analysis and proofs of concept.

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DevOps

As the term suggests, DevOps refers to a combined approach to development and operations. DevOps is a model that has successfully been used in software development firms. ADVA has translated this model into a combined hardware plus software R&D environment. By adopting this model, ADVA is encouraging communication, collaboration and shared goals across cross-functional teams in all business areas. With a set of practices and policies being adopted by the whole team, the aim is to improve quality at all stages of the development lifecycle by enabling fast feedback loops and rapidly changing systems.

ADVA implemented a fully integrated, value-stream oriented DevOps model of organization involving product-line management, R&D and new product introduction, lifecycle engineering and quality management. It also developed a merged approach to system verification testing, network engineering and customer application testing. This setup allows a smooth and efficient integration of new products to existing portfolios. In 2017, ADVA was able to integrate the relevant products from the MRV acquisition to its FSP 3000 and FSP 150 families within just a few months.

To further foster agile, iterative DevOps processes, ADVA expanded its activities in the photonic integration area and launched development projects for highly integrated optical components and modules with the objective of reducing product cost and increasing product differentiation.

The company's market-leading product offering is the result of its DevOps set up. New innovation ensures ADVA's position as a global technology leader in important growth markets. The company continues to evolve its leading intellectual property rights portfolio, which currently (status Dec 31, 2018) includes more than 269 granted individual patents in 176 patent families.

As a member of all key industry standardization groups, ADVA makes a significant contribution to the development of standards. It also demonstrates technology leadership through multiple publications and presentations. Through new technology trials and the development of early prototypes, ADVA plays a significant role in validating innovative ideas and concepts. Strategies are developed in close cooperation with partners, including suppliers and colleagues in research centers and universities. Many collaborative projects are conducted in conjunction with partner organizations.

The DevOps teams innovate in the areas of optics, Ethernet, network management software, fiber assurance as well as network virtualization and network synchronization (under the Oscilloquartz brand). The development processes are completely agile and iterative, targeted to reinforce ADVA's position as a leader in the field of programmable networking on a secure, flexible infrastructure.

ADVA is also developing its own differentiated optical submodules which will enable it to tailor solutions more closely to individual customer needs for a more vertically integrated value chain. The commercially successful MicroMux™ module, for example, is a tangible result of these activities. The module significantly expands the capabilities of the FSP 3000 CloudConnect™ and can also be used in third-party devices.

The company continuously evolves its organization further by embracing DevOps strategies for both hardware and software, always with the customer as the central focus.

BLC organization

As technology and the demands of customers change over time, business approaches need to constantly evolve and adapt. ADVA's business lifecycle planning involves identifying the wishes and needs of actual and future customers. Requirements for product features, as well as delivery and service activities, are then determined. Challenges are reviewed prior to giving a final commitment to supply products and/or services. This approach ensures that requirements are clearly defined and understood, potential issues are resolved and ADVA is able to meet and exceed customer expectations. The BLC organization is clearly centered on the customer.

"Speed for customers" is a key promise of the ADVA brand. This promise is directly reflected in the way the company aligns its supply chain management and sales & operations teams. Intelligent IT tooling creates full transparency along the entire value chain, leading to better forecasting, material planning, shorter delivery times and higher inventory turnover.

In the areas of manufacturing, logistics and reverse logistics, ADVA has developed over the years a tightly integrated approach with two best-in-class, global Tier 1 EMS partners. The production system and degree of automation have been continuously optimized. The global EMS providers are now taking over the entire value chain from material purchasing, PCB assembly and final assembly, software loading and functional testing to storage and distribution logistics. Colocated ADVA experts monitor the results of the individual production and testing steps using remote shop floor control systems and ensure efficient communication between ADVA's development centers and the manufacturing partners. The fast and immediate feedback on manufacturability (design for manufacturing, DfM) leads to short time to market (TtM) and ensures a very high product quality at a competitive cost. Today ADVA can transfer the production of selected products between manufacturing partners' sister locations within eight weeks. The manufacturing system can thus react dynamically to intensifying global trade conflicts and minimize tariffs and penalties in the interest of customers.

ADVA keeps increasing transactional efficiency through automation and robotics wherever possible, both in house as well as at the EMS sites. ADVA's experts focus on creating customer value in the areas of network staging, quality and the expansion of the award-winning portfolio of logistics services. This portfolio is founded on a groundbreaking supply chain model where materials are dispatched to installation sites precisely when needed; the refurbishment and recycling of materials returned by customers; and ADVA's radical approach to collaborating with customers on planning to maximize flexibility.

The company's strategic procurement team has established rigorous processes for supplier onboarding, supplier performance and stringent component cost management. Procurement is closely integrated with the R&D teams to negotiate volume pricing in the product design phase and assure lowest product cost later in the product lifecycle.

Liang Liu

"Our shared vision is about empowering customers to connect more quickly, more securely and more sustainably."

It is important to note that requirement planning, supply chain management, forward and reverse logistics and ADVA's broad range of service offerings are all fully supported by one common and highly integrated business application infrastructure. Its main constituents are enterprise resource planning (ERP), product data management (PDM) and customer relationship management (CRM). This integrated transactional platform is the key to organizational efficiency and is constantly being enhanced by a team of application analysts using agile project management methods. ADVA's operating principle is to move any acquisition fully onto the company's process- and organizational setup in less than six months. Fast and decisive integration are key to unleashing operational synergies and scale.

Quality management

ADVA strives to deliver world-class quality in all areas. From research and development, through production and supply chain management, all the way to post-sales technical support, quality management is crucial to maintaining the company's reputation as a trusted partner and its position as a quality leader in the market place. ADVA's quality management system is based on carefully controlled business processes and dynamic, continuous improvement. To ensure high-quality products, customer satisfaction and sustainability, it takes a top-down approach and its quality management team reports directly to the chief executive officer. To eliminate weaknesses in all areas, ADVA's quality management team also deals with cross-functional quality planning and monitoring.

In 2018, ADVA undertook its annual maintenance audit according to the international telecommunications quality management standards TL 9000 R6.0 and ISO 9001-2015 as well as ISO 14001-2015 for environmental management and ISO 50001 for energy management. Once again, ADVA passed with outstanding results.

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ADVA takes a holistic approach to quality assurance. This begins with a clear focus on optimizing product development, continues into excellence in operations through close collaboration with our suppliers and manufacturing partners, and continues into the shipping of products to customers and the provision of technical support. With regard to operation activities, supplier quality is a vitally important component of quality management. Compliance with stringent quality standards and continued improvement are ensured through thorough selection of suppliers, periodic evaluation through audits and systematic inspection of incoming goods. This is also supported by cross-functional commodity teams and the ever-increasing involvement of ADVA's suppliers in the development process.

Compliance with ADVA's quality management process is driven by the quality management team, which takes a proactive approach to problem solving as well as to advanced quality planning for new products in development and optimization of business processes across the entire value chain. ADVA's quality management process is underpinned by strong customer orientation and a clear focus on customer experience. This results in greater efficiency and very high customer satisfaction ratings. For 2018, ADVA's net promoter score was +52% (a slight decrease compared to the outstanding scores of +56% in 2017 and +60% in 2016). This result underlines the company's focus on customer satisfaction and its commitment to continuous improvement.

To identify weaknesses and opportunities to optimize cross-functional business processes, ADVA analyzes outcomes based on Lean Six Sigma methodologies. This ensures all aspects of the business can be measured and analyzed so that waste can be eliminated from every process.

In 2018, key performance indicators (KPIs) for product-line quality such as early return indicators (ERIs), yearly return rate (YRR) and long-term return rate (LTR) were continually improving and well below the industry average in many product areas. These metrics also improved on previous years giving the company its best KPIs to date. TIA (formerly the QuEST Forum), the global organization dedicated to quality and sustainability in the ICT community, has praised ADVA for having "developed a culture of continuous improvement in many areas." Members of ADVA's quality management team continue to share best practices at TIA events around the world.

IT strategy

More than a decade ago, ADVA's IT team recognized that a traditional approach to IT tools and methodologies would no longer be sufficient. In order to meet growing demand for agility, speed and customer experience, a different strategy was necessary – one that could empower IT to deliver more business value by driving innovation and quickly adapting new technologies.

In recent years, the IT team has focused on the transition from a classic setup to a modern IT service architecture. Automation of routine tasks and automatic service delivery were major milestones, along with the transition of services into a hybrid cloud.

Today, important business processes and major changes, such as those resulting from acquisitions, must be quickly merged into the company's existing IT infrastructure and application framework, enabling the transition from an infrastructure-oriented, purely cost-driven organization to a business-service-oriented organization.

In the digital age, IT services are becoming a differentiator and an enabler of new business models. The growing need for agility to stay competitive and to be more efficient across organizational borders demands a paradigm shift and the adoption of new practices.

ADVA's IT team is well aware of the disruptive market changes caused by digitalization. Through its business-process and applications teams, ADVA has been taking targeted action since 2017 to successfully manage its digital transformation and move towards its goal of becoming a digital leader in the industry.

The data center has evolved a great deal in recent years due to the growth in cloud technology. The move to software-defined networking and storage architecture has enabled ADVA to quickly provision new IT services. The company is also changing its internal service structure to benchmark service costs with cloud services. This allows it to quickly decide where to move services in a hybrid cloud environment.

In addition to the excellent unified IT infrastructure, ADVA benefits from its highly integrated and standardized applications landscape, which enables it to integrate acquisitions within just a few months.

ADVA's vision of IT in the future is characterized by the following points:

- **Data analytics center of excellence (CoE)**
  Establishing this CoE enables the company to build up and bundle analytics capabilities under one common platform
- **Robotic process automation (RPA)**
  This involves the automation of routine business practices with "software robots" that perform recurring tasks automatically
- **IoT platform**
  Allows ADVA to connect with customer network management systems for the purpose of identifying, coordinating, prototyping, and implementing digital business models and services related to IoT topics as well as using AI/ML technology to support customers and internal business units with predictive maintenance and advanced data visualization
- **Collaboration platforms (Enterprise 2.0)**
  Collaboration between different departments as well as external partners, suppliers and customers is a key requirement. ADVA's IT team continues to evolve the company's collaboration platform, combining the newest on-premises and cloud solutions into one core platform
- **Unified communication**
  A state-of-the-art communication platform allows ADVA employees to quickly communicate and exchange information on any device, helping the company to drive team innovation across sites
- **Advanced security**
  Extended rights management and encryption protects critical business information and personal data. ADVA uses cloud-based machine learning and AI to identify threats to its environment; extended multifactor authentication simplifies access to ADVA data for employees
- **Hybrid cloud**
  ADVA extends its hybrid cloud to support all R&D software development processes with a cost-optimized solution

Going forward, ADVA's IT team will continue to analyze and quickly incorporate any new technology trends that can benefit the company's service offerings. Emerging trends like microservices have already been tested and will allow ADVA to become even more agile. This will also help the company to control and adjust service cost.

ADVA's IT team is committed to increasing the company's internal customer satisfaction score from 85% to 90%.

Compliance and sustainability

Corporate ethics and compliance

Integrity and ethical decision-making are central requirements for the sustainable success of ADVA. The group recognizes its responsibility to comply with national and international laws and regulations, internal policies and ethical standards – otherwise known as compliance. Its commitment to compliance is continuously communicated and reinforced not only by the management board but also by the group's (line) managers. It is based on ADVA's core values, which translate into a holistic code of conduct and a range of group-wide policies that govern the group's business operations and are mandatory for all employees to follow.

ADVA's code of conduct and group-wide policies are embedded into a robust compliance management system, which is structured according to the legal requirements and best practices of the group's key countries of operation, as well as common international standards. The following elements are covered:

- Strong "tone from the top"
- Periodic risk assessments
- Proportionate risk-mitigating processes and controls
- Periodic compliance training and regular communication
- Means for in-person as well as anonymous reporting
- Proportionate responses to compliance violations
- Continuous improvement of all compliance procedures

The group's compliance management system is supported by a central compliance department and currently six regional compliance officers. Activities are coordinated by ADVA's chief compliance officer who reports to the chief executive officer and the supervisory board. Whenever employees have questions or suggestions related to compliance or suspect incidents of non-compliance, they are encouraged to speak up. In addition to clearly defined and actively communicated internal points of contact, an external ombudsman (this role is currently covered by Frank Fischer, tax lawyer and former member of ADVA's supervisory board) and an externally operated ethics and compliance helpline enable confidential and anonymous reporting.

Sustainability

ADVA's commitment to ethical decision making extends to the group's operations and products. Related activities are typically referred to as sustainability. The importance of sustainability for ADVA is best illustrated by the group's successful track record in the related areas. To continuously strengthen the group's sustainability record, a dedicated sustainability department with a direct reporting line to the group's chief technology officer is in place.

ADVA's sustainability program is based on a holistic model covering the range of all related aspects. It is shown in the following diagram:

The outlined model has been jointly developed by British Telecom and the QuEST Forum, the body which defines the TL 9000 as the telecommunication industry's version of the international quality standard ISO 9001. It is meanwhile further maintained by the Telecommunications Industry Association. Therefore, it is used by several large network operators and system vendors worldwide for assessments or self-assessments of performance across the different sustainability segments. In 2018, ADVA achieved its second consecutive "Gold" ranking according to this model.

Furthermore, the group is regularly assessed regarding its sustainability performance by independent bodies like EcoVadis and the Carbon Disclosure Project (CDP). In 2018, the group also achieved its second consecutive "Gold" ranking in the EcoVadis assessment, putting ADVA in the top 5% of companies ranked by that platform.

In order to further strengthen the group's sustainability strategy and efforts, ADVA joined the Science-Based Targets Initiative (SBTi) in 2016 as one of the first 200 companies worldwide and one of the first 10 German companies. In 2017, the group submitted its emissions-reduction targets. Validation and acceptance in particular of the Scope-3 target proved relatively complex and is now expected for the first half of 2019. SBTi is a joint initiative by CDP, UN Global Compact, the World Resources Institute and the WWF. Its key aim is to support the restriction of global warming to within 2°C (3.6°F) compared to pre-industrial temperatures.

Finally, details regarding the group's sustainability program, performance and indicators are also summarized in ADVA's code of conduct and its annual sustainability report, which is compiled according to the Global Reporting Initiative's (GRI) standard. Both resources are publicly available on the group's website www.advaoptical.com.

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Combined management report

Basis of preparation

This report combines the group management report of ADVA Optical Networking group ("the group", "ADVA Optical Networking" or "ADVA"), comprising ADVA Optical Networking SE (hereafter referred to as "the company", "ADVA Optical Networking SE" or "ADVA SE") and its consolidated subsidiaries, and the management report of ADVA Optical Networking SE.

The combined management report of ADVA Optical Networking SE was prepared in accordance with sections 315 and 315a of the German Commercial Code (Handelsgesetzbuch, HGB) and German Accounting Standards (Deutsche Rechnungslegungs-Standards) No. 17 and 20 (DRS 17 and 20).

All information contained in this report relates to the status on December 31, 2018, or the financial year ending on that date, unless stated otherwise.

The purchase price allocation for the acquisition of MRV Communications group has been finalized in 2018. According to IFRS 3.49 prior period information in the balance sheet has been adjusted accordingly.

Forward-looking statements

The combined management report of ADVA Optical Networking SE contains forward-looking statements using words such as "believes", "anticipates" and "expects" to describe expected revenues and earnings, anticipated demand for optical networking solutions and anticipated liquidity from which internal estimates may be inferred. These forward-looking statements are based on the beliefs of the management board and respective assumptions made, and involve a number of unknown risks, uncertainties and other factors, many of which are beyond ADVA Optical Networking's control. If one or more of these uncertainties or risks materializes, or if the underlying assumptions of the management board prove incorrect, actual results can differ materially from those described in or inferred from forward-looking statements and information. Unknown risks and uncertainties are discussed in the "risk report" section further below.

Strategy and control design

ADVA's strategic goals are focused around growth & profitability, innovation, operational excellence and our employees. The strategic goals are reviewed by both the management board and the supervisory board on a yearly basis and amended where appropriate. Each of these goals is defined in detail and then broken down into specific departmental and individual targets. The strategic goals are traced to each individual employee, so that each employee can focus and be evaluated on his/her individual performance and contribution to ADVA's overall performance.

ADVA measures the accomplishment of its strategic goals against revenues, pro forma operating income, net liquidity and as a non-financial criterion customer satisfaction as measured by the net promoter score. These metrics represent the group's key performance indicators. The management board sets target values for all four metrics for the coming year and measures actual values against the target values on a monthly basis for revenues and pro forma operating income, on a quarterly basis for net liquidity and on a yearly basis for the net promoter score. In case of deviations from plan, corrective action can be taken quickly. This information is summarized and communicated to the management board in monthly, quarterly and yearly reports.

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General economic and market conditions

The global economy in 2018

The year 2018 was marked by much political and economic turmoil. Most of the factors that created uncertainty in the markets over the past year continue to be relevant and are by no means resolved in 2019. In its January 2019 edition of the World Economic Outlook, the International Monetary Fund (IMF) provided the following view on the state of the global economy:

"The global expansion has weakened. Global growth for 2018 is estimated at 3.7 percent, as in the October 2018 World Economic Outlook (WEO) forecast, despite weaker performance in some economies, notably Europe and Asia. The global economy is projected to grow at 3.5 percent in 2019 and 3.6 percent in 2020, 0.2 and 0.1 percentage point below last October's projections.

"The global growth forecast for 2019 and 2020 had already been revised downward in the last WEO, partly because of the negative effects of tariff increases enacted in the United States and China earlier that year. The further downward revision since October in part reflects carry over from softer momentum in the second half of 2018 – including in Germany following the introduction of new automobile fuel emission standards and in Italy where concerns about sovereign and financial risks have weighed on domestic demand – but also weakening financial market sentiment as well as a contraction in Turkey now projected to be deeper than anticipated.

"Risks to global growth tilt to the downside. An escalation of trade tensions beyond those already incorporated in the forecast remains a key source of risk to the outlook. Financial conditions have already tightened since the fall. A range of triggers beyond escalating trade tensions could spark a further deterioration in risk sentiment with adverse growth implications, especially given the high levels of public and private debt. These potential triggers include a "no-deal" withdrawal of the United Kingdom from the European Union and a greater-than-envisaged slowdown in China."

While macroeconomic changes do not necessarily have a direct impact on the market for networking technology, it is important to acknowledge that ADVA generates the majority of its revenue in developed countries. The company's largest customer group is communications service providers, which in turn play a critical role in the process of digitization and the construction of economically relevant communications infrastructure.

Market environment for ADVA

The addressable market for ADVA is determined by the digitization of ecosystems and the resulting increase in demand for cloud-based solutions and the underlying communication networks. The rapid adoption of digital processes across all industries, the creation and use of artificial intelligence, and the ubiquitous use of high-definition video over mobile and fixed networks are important and sustainable growth drivers for the market.

ADVA's network technology enables the construction of a high-performance communications infrastructure that serves as the basis for the digital economy, the industrial internet of things (Industrial IoT) – often referred to as Industry 4.0 in Germany – and the digitization of ecosystems. The company addresses important applications in this growth market. Fiber optic transmission technology delivers scalable bandwidth for network operators' infrastructure and the data center interconnect (DCI) of large enterprises and internet content providers. At the edge of the network, the company's cloud access technology with virtualization enables fast and flexible provision of cloud services. In addition, the company's synchronization technology ensures the highest performance in the construction of mobile broadband networks and globally distributed data centers. Especially in Europe, there has been a backlog in the expansion of communications infrastructure since the 2008 financial crisis. The upcoming introduction of 5G mobile technology further intensifies the investment pressure.

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ADVA is well positioned in the WDM market, the core segment of the overall optical network market, in many areas. The adjacent market for Ethernet-based network access solutions is gaining new momentum with the introduction of virtualized network features. Here, the company's solutions can address more and more new growth applications and open up additional opportunities. ADVA is the technological leader in synchronization technology. The total addressable market for ADVA is estimated to be USD 14 billion* in 2018, growing to USD 21 billion by 2023 at a CAGR (2018-2023) of 7.65 (see also the chapter "Market, target customers and growth drivers").

* Industry analyst estimates for access, metro and long-haul WDM equipment ("optical") and access switching & routing ("packet edge") relevant to ADVA. Sources: Ovum, "optical networks forecast 2018-2023" published January 2019 and "service provider switching and routing forecast 2018-2023", published August 2018

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Maurice Baarslag

"We have some of the industry's most able and experienced innovators. But no individual member is as smart as the whole team. Together we're removing barriers, adding value and creating tomorrow's opportunities."

Business development and operational performance of the group

Revenues

Revenues represent one of the four key performance indicators for ADVA. In 2018, the group generated revenues of EUR 502.0 million, a decrease of 2.4% on revenues of EUR 514.5 million in 2017. The decrease is mainly attributable to the significant decline in revenue with one of the largest Internet content providers (ICP) in North America. This major customer had contributed high sales in the first half of 2017, which could not be fully compensated in 2018. In contrast, quarterly sales increased sequentially in all four quarters in 2018 and reached the amount of EUR 131.5 million in Q4 2018, representing a growth of 4.2% compared to the previous quarter.

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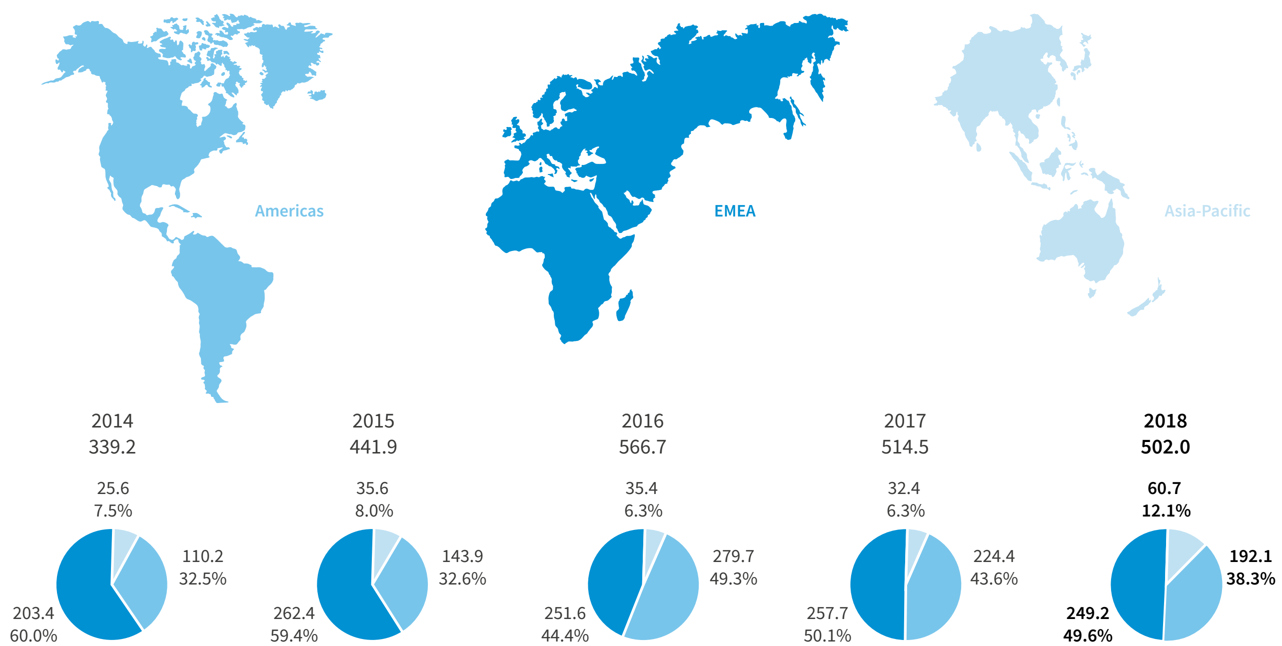
Revenues by region

(in millions of EUR and relative to total revenues)



In 2018, EMEA (Europe, Middle East and Africa) was reported as the most significant sales region, followed by the Americas and at third place Asia-Pacific.

Year-on-year, EMEA revenues of EUR 249.2 million in 2018 were down from EUR 257.7 million in 2017. This is primarily due to slightly weaker sales in some countries outside Central Europe, the Middle East and Africa. In Central Europe, on the other hand, business developed again very positively.

In the Americas, revenues decreased from EUR 224.4 million in 2017 to EUR 192.1 million in 2018. This decrease is a direct result of the decline in orders by a major customer in the ICP segment as already mentioned above.

In the Asia-Pacific region, revenues significantly increased from EUR 32.4 million in 2017 to EUR 60.7 million in 2018, mainly attributable to the acquisition of the MRV group in 2017. MRV had a respectable presence with customers in APAC, including major customers. As a result, business activity in this region is slightly less affected by fluctuating project business and, as a percentage, makes a greater contribution to the group's total revenue than in previous years.

Results of operations

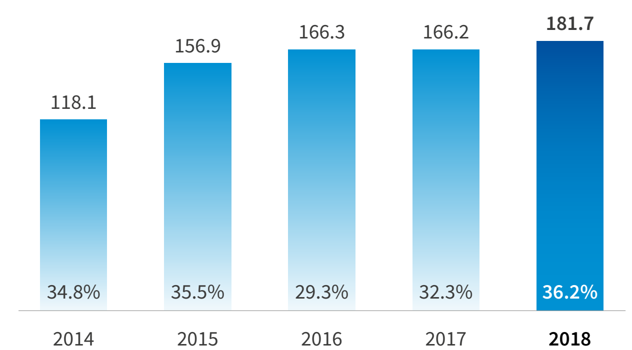
(in millions of EUR, except earnings per share)	2018	Portion of revenues	2017	Portion of revenues
Revenues	**502.0**	**100.0%**	**514.5**	**100.0%**
Cost of goods sold	-320.3	63.8%	-348.3	67.7%
Gross profit	**181.7**	**36.2%**	**166.2**	**32.3%**
Selling and marketing expenses	-63.5	12.7%	-62.9	12.2%
General and administrative expenses	-35.0	7.0%	-36.3	7.0%
Research and development expenses	-76.6	15.3%	-69.0	13.4%
Other operating income and expenses, net	8.4	1.7%	6.4	1.2%
Operating income	**15.0**	**3.0%**	**4.4**	**0.9%**
Interest income and expenses, net	-1.4	0.3%	-0.8	0.2%
Other financial gains and losses, net	-1.1	0.2%	-3.8	0.7%
Income/(loss) before tax	**12.5**	**2.5%**	**-0.2**	**0.0%**
Income tax expense (benefit), net	-2.8	0.6%	-4.0	0.8%
Net income/(loss)	**9.7**	**1.9%**	**-4.2**	**0.8%**
Earnings per share (in EUR)				
basic	0.19		-0.09	
diluted	0.19		-0.09	

Cost of goods sold and gross profit

Cost of goods sold decreased from EUR 348.3 million in 2017 to EUR 320.3 million in 2018, primarily due to the lower revenues. Cost of goods sold includes amortization charges for capitalized development projects of EUR 28.4 million in 2018 after EUR 29.0 million in 2017.

Gross profit

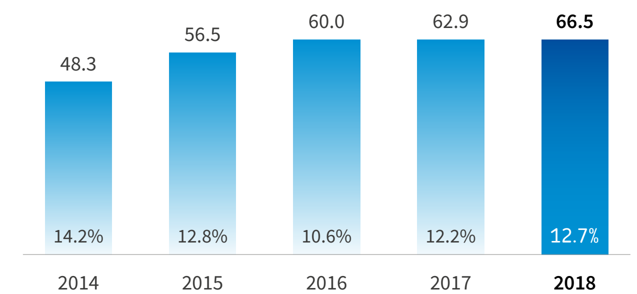
(in millions of EUR and relative to total revenues)



Gross profit improved to EUR 181.7 million in 2018 after EUR 166.2 million in 2017, comprising 36.2% and 32.3% of revenues, respectively. The development of the group's gross margin in general is impacted by variations in regional revenue distribution and in product and customer mix.

Selling and marketing expenses

(in millions of EUR and relative to total revenues)

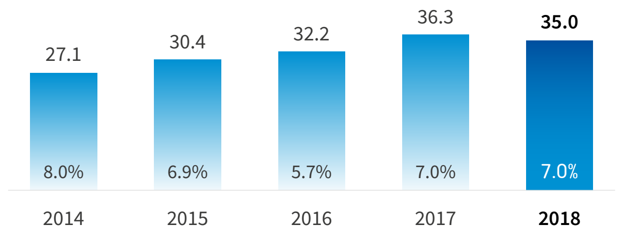


Selling and marketing expenses of EUR 63.5 million in 2018 were slightly up from EUR 62.9 million in 2017, and comprised 12.7% and 12.2% of revenues, respectively. This increase is mainly attributable to increased personnel expense predominantly due to increased variable remuneration and expenses related to the issuance of stock options.

ADVA continues to invest in post-sales customer service and intensified direct-touch activities with those key customers served via indirect distribution channels. Establishing direct contact enables the group to work more closely with its end customers and better understand their specific requirements, which in turn helps in developing market-relevant products.

General and administrative expenses

(in millions of EUR and relative to total revenues)



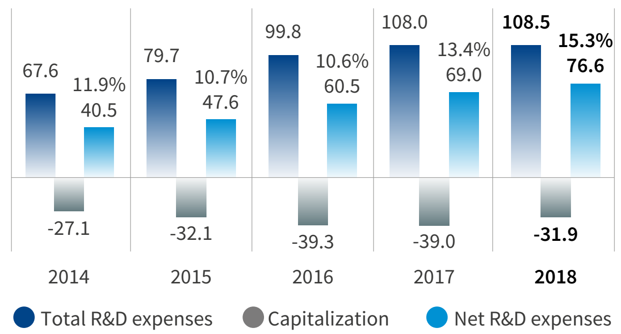
General and administrative expenses at EUR 35.0 million in 2018 were down from EUR 36.3 million recorded in 2017. The share of total revenues remained stable at 7.0% in 2017 and 2018. The decline resulted primarily from higher costs incurred in 2017 related to the integration of the MRV Communications group.

Sandra Dressel
Daniela Pandorf

"On every continent, across every campus, we're listening to customers and to each other. Connecting individuals, families, businesses and communities is what motivates our global team."

Research and development expenses

(in millions of EUR and relative to total revenues)



ADVA's research and development activities are driven by the distinct emphasis on differentiating its innovative connectivity solutions for cloud and mobile services and working with customers and partners to identify and meet their current and future needs. The resulting key technologies and products simplify complicated network structures and supplement existing solutions. During 2018, research and development activities were focused on the following three technology areas:

- Enhancements to the open optical transport solution including the development of the new TeraFlex™ terminal
- A new generation of 100G products including NFV software for the company's cloud access portfolio
- Ultra-precise synchronization technologies for 5G mobile networks

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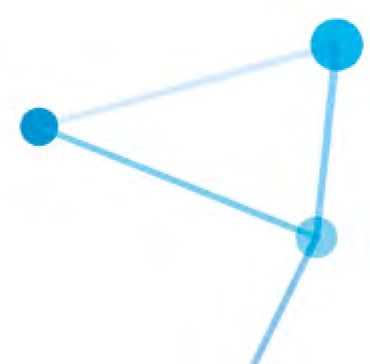
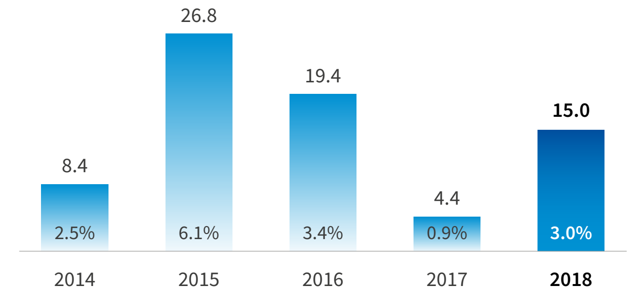
At EUR 76.6 million in 2018, net research and development expenses were up from the EUR 69.0 million in 2017, thereby constituting 15.3% of revenues in 2018 after 13.4% in the prior year. Capitalization of development expenses of EUR 31.9 million in 2018, was down from EUR 39.0 million seen in 2017. The capitalization rate in 2018 amounted to 29.4% (prior year: 36.1%). The increase in net R&D expenses mainly relates to the decrease in capitalization in the area of network functions virtualization.



Operating income

(in millions of EUR and relative to total revenues)



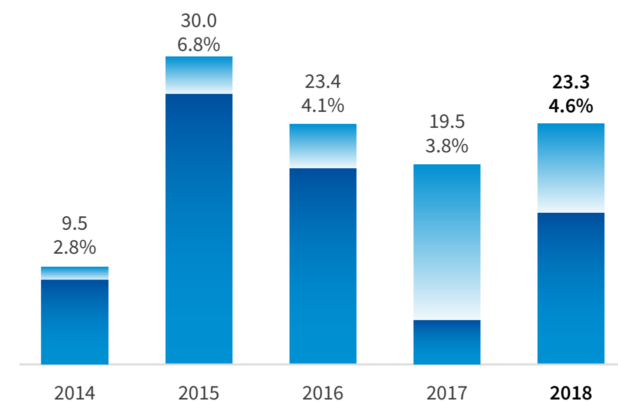
Net other operating income and expenses amounted to positive EUR 8.4 million in 2018, up from positive EUR 6.4 million in the prior year. This item is mainly impacted by subsidies received for specific research activities and release of provisions created in earlier periods.

Total operating expenses increased from EUR 161.8 million in 2017 to EUR 166.7 million in 2018, representing 33.2% of revenues in 2018 after 31.4% in the prior year.

Overall, ADVA reported a significantly increased operating income of EUR 15.0 million in 2018 after an operating income of EUR 4.4 million in the prior year. The increase in operating result is largely due to the improved gross margin.

Pro forma operating income

(in millions of EUR and relative to total revenues)

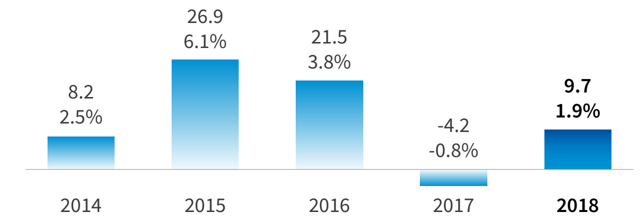


Pro forma operating income represents one of the four key performance indicators for the group. As pro forma operating income excludes non-cash charges related to stock compensation and business combinations as well as non-recurring expenses related to restructuring measures, ADVA's management board believes that pro forma operating income is a more appropriate measure than operating income when benchmarking the group's operational performance against other telecommunications equipment providers.

The increase of pro forma operating income from EUR 19.5 million in 2017 to EUR 23.3 million in 2018 is mostly due to the improved operating income discussed above. However, pro forma operating income increased at a lower rate as one-time restructuring expenses that negatively impacted operating income have been excluded in the pro forma calculation in the prior year.

Net income (loss)

(in millions of EUR and relative to total revenues)



Given the favorable development of operating income ADVA reported net income of EUR 9.7 million for 2018, after a net loss of EUR 4.2 million in 2017. Beyond operating income, the net result in 2018 included net interest expenses of EUR 1.4 million (prior year: EUR 0.8 million) and net other financial losses of EUR 1.1 million (prior year: net other financial loss of EUR 3.8 million) relating to the translation of foreign currency assets and liabilities and to gains and losses on hedging instruments. Moreover, an income of EUR 0.4 million from the write-up of an asset for sale has been included in 2018.

In 2018, the group reported an income tax expense of EUR 2.8 million after an income tax expense of EUR 4.0 million in 2017. The tax expense in 2018 predominantly represents the common group tax rate applied on income before tax. In 2017, the tax expense was mainly due to effects from the changed US tax rate as well as income tax prepayments.

Earnings per share

Basic and diluted earnings per share were EUR 0.19, each, in 2018 after EUR -0.09, each, in the prior year. Basic average shares outstanding increased by 0.2 million to 49.8 million in 2018, due to capital increases from the exercise of stock options. Diluted weighted average shares outstanding were at 50.2 million in 2018. Due to the net loss reported in 2017 no dilution effects had to be considered in the earnings per share calculation.

Summary: Business development and operational performance

Operating income increased significantly in 2018 compared to the previous year due to the increase in gross margin. Furthermore, ADVA reported a lower tax expense as well as an improved other financial result. Consequently, the net result improved significantly in 2018.

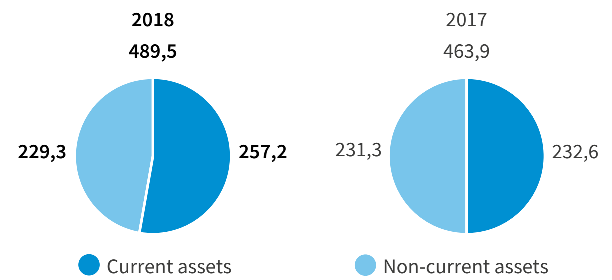
Net assets and financial position of the group

Balance sheet structure

ADVA's total assets increased by EUR 22.6 million or 4.9%, from EUR 463.9 million at year-end 2017 to EUR 486.5 million at the end of 2018.

Assets

(on December 31, in millions of EUR)



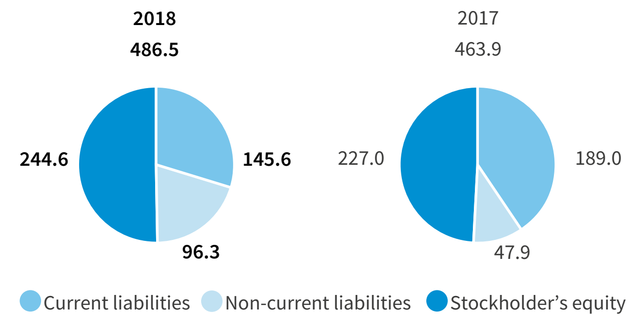
Current assets increased by EUR 24.6 million or 10.6% from EUR 232.6 million on December 31, 2017 to EUR 257.2 million on December 31, 2018 and comprised 52.9% of the balance sheet total after 50.1% at the end of the prior year. The increase in current assets was mainly driven by a significant rise in trade accounts receivable by EUR 16.6 million to EUR 97.9 million. Days sales outstanding increased to 68 days in 2018 after 60 days reported 2017. At the same time, cash and cash equivalents and inventories increased. Cash and cash equivalents were at EUR 62.7 million at the end of December 2018 up by EUR 4.3 million compared to prior year, mainly due to higher income before tax. Inventories increased from EUR 81.7 million at the end of 2017 to EUR 85.7 million at December 31, 2018, while inventory turns remained fairly stable at 4.0x in 2018 after 4.1x reported in 2017.

Non-current assets decreased by EUR 2.0 million from EUR 231.3 million at year-end 2017 to EUR 229.3 million on December 31, 2018. Within non-current assets, other intangible assets decreased mainly due to scheduled amortization by EUR 5.3 million to EUR 31.5 million. At the same time, deferred tax assets decreased by EUR 3.3 million to EUR 7.3 million at the end of 2018. Deferred tax assets and liabilities are presented net in accordance with relevant netting requirements. On the other side, capitalized development projects increased by EUR 2.7 million to EUR 87.9 million at year-end 2018. The increase was largely driven by developments of the future product platform for innovative connectivity solutions. Moreover, goodwill increased by EUR 2.2 million to EUR 70.4 million mainly due to foreign exchange rate changes

Meaningful additional assets belonging to ADVA are the broad and global customer base of several hundred service providers and thousands of enterprises, the ADVA, Oscilloquartz and Ensemble brands, the vendor and partner relationships and a highly motivated and skilled global team. These assets are not included in the balance sheet. Customer satisfaction as measured by the net promoter score represents one of the group's four key performance indicators.

Liabilities

(on December 31, in millions of EUR)



With respect to equity and liabilities, current liabilities decreased significantly by EUR 43.4 million from EUR 189.0 million at year-end 2017 to EUR 145.6 million at the end of 2018, primarily due to decreases in current financial liabilities by EUR 59.7 million as discussed in section financial liabilities. Current provisions decreased by EUR 7.0 million mainly due to the inclusion of one-time restructuring measures in 2017. At the same time, trade accounts payable increased significantly by EUR 24.0 million to EUR 63.2 million at year-end 2018, with days payable outstanding reduced to 55 days in 2018 from 59 days in 2017. The increase in trade accounts payable is driven by the order oriented timing of material purchases.

Non-current liabilities at EUR 96.3 million at year-end 2018 were significantly up from EUR 47.9 million reported at prior year end. Within non-current liabilities, non-current financial liabilities increased by EUR 52.6 million to EUR 70.1 million at the end of 2018. Financial liabilities are explained in more detail in a separate section. At the same time, deferred taxes reported in liabilities decreased by EUR 1.7 million to EUR 10.8 million at the end of 2018.

Stockholders' equity increased by EUR 17.6 million from EUR 227.0 million at year-end 2017 to EUR 244.6 million at the end of 2018, mainly due to net income of EUR 9.7 million reported in 2018. In 2018, capital increases totaling EUR 0.8 million from the exercise of stock options, and stock compensation expenses totaling EUR 1.4 million, were reported.

Balance sheet ratios

The equity ratio improved to 50.3% at the end of 2018, after 48.9% at year-end 2017. The non-current assets ratio amounted to 106.7% on December 31, 2018, with stockholders' equity covering the non-current assets.

(on December 31, in %)		2018	2017
Equity ratio	Stockholders' equity / Total assets	50.3	48.9
Non-current asset ratio	Stockholders' equity / Non-current assets	106.7	98.2
Liability structure	Current liabilities / Total liabilities	60.2	79.8

Capital expenditures

Capital expenditures for additions to property, plant and equipment in 2018 amounted to EUR 14.0 million, up from EUR 10.6 million in 2017, largely reflecting higher investments technical equipment.

Capital expenditures for intangible assets of EUR 34.2 million in 2018 were down from EUR 44.0 million in the prior year. This total consists of capitalized development projects of EUR 31.9 million in 2018 after EUR 39.0 million in 2017, and investments in software licenses and other intangible assets of EUR 2.3 million in 2018 after EUR 5.0 million in 2017. Investments in capitalized development projects are mainly driven by development activities for the new FSP 3000 CloudConnect™.

Cash flow

(in millions of EUR)	2018	Portion of cash	2017	Portion of cash
Operating cash flow	60.4	96.3%	27.1	46.5%
Investing cash flow	-48.1	76.7%	-90.5	155.1%
Financing cash flow	-8.2	13.1%	36.9	63.2%
Net effect of foreign currency translation on cash and cash equivalents	0.2	0.3%	0.0	0.0%
Net change in cash and cash equivalents	**4.3**	**6.8%**	**-26.5**	**45.4%**
Cash and cash equivalents at the beginning of the period	58.4	93.2%	84.9	145.4%
Cash and cash equivalents at the end of the period	**62.7**	**100.0%**	**58.4**	**100.0%**

Cash flow from operating activities at EUR 60.4 million in 2018 was significantly up EUR 33.3 million from EUR 27.1 million in 2017. This development was largely due to increase in income before tax and lower usage of cash in working capital.

Cash flow from investing activities was negative EUR 48.1 million in 2018 after negative EUR 90.5 million in the prior year. The use of funds for investing activities in 2017 was largely due to the acquisition of MRV Communications. At the same time, capital expenditures for capitalized development projects in 2018 decreased compared to the previous year.

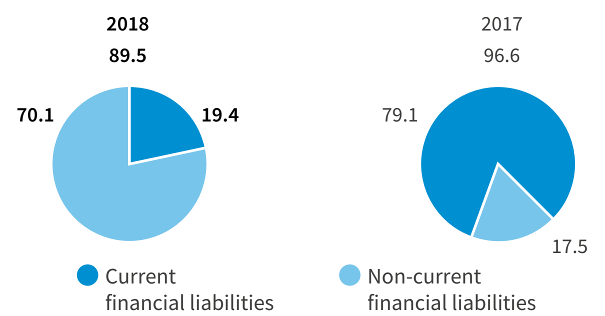
Finally, cash flow from financing activities at negative EUR 8.2 million in 2018 was significantly down compared to the 2017 level of positive EUR 36.9 million. The net cash inflow in 2017 was mainly impacted by the acceptance of a new loan used for financing of the acquisition of MRV Communications. In 2018, the cash outflows mainly included scheduled servicing of existing debt.

Overall, including the net effect of foreign currency translation on cash and cash equivalents of EUR 0.2 million (2017: EUR 0.0 million), cash and cash equivalents essentially increased by EUR 4.3 million in 2018, from EUR 58.4 million at year-end 2017 to EUR 62.7 million at the end of 2018, after a decrease of EUR 26.5 million in the prior year.

Financing and liquidity

ADVA's financial management is performed centrally by ADVA Optical Networking SE. Its objective is to provide sufficient funds to ensure ongoing operations and to support the group's projected growth. Beyond the strong equity base appropriate for the business, ADVA finances its business by means of liabilities with maturities typically exceeding the life of the assets being financed. For any liability taken, ADVA is focused on minimizing related interest cost, as long as access to funds is not at risk. Excess funds are generally used to redeem.

FINANCIAL LIABILITIES
(on December 31, in millions of EUR)



Financial liabilities decreased from EUR 96.6 million at year-end 2017 to EUR 89.5 million at the end of 2018. In 2018, a current bridge financing facility for the acquisition of the MRV Communications group, has been refinanced via a syndicated loan of nominal EUR 65.0 million with a total maturity of five years. Therefore, the current portion significantly decreased by EUR 59.7 million to EUR 19.4 million while the non-current portion was up from EUR 17.5 million on December 31, 2017, to EUR 70.1 million at the end of December 2018. All financial liabilities were exclusively denominated in EUR at the end of 2017 and 2018.

On December 31, 2018, the group had available EUR 10.0 million (on December 31, 2017: EUR 8.0 million) of undrawn committed borrowing facilities in respect of which all conditions had been met. The credit line was also renegotiated as part of the refinancing.

Further details about the group's financial liabilities can be found in note (16) to the consolidated financial statements.

NET LIQUIDITY

Net liquidity represents one of the four key performance indicators for ADVA. Due to the increase in cash and cash equivalents and decrease in financial liabilities in 2018, ADVA's net liquidity at negative EUR 26.8 million on December 31, 2018, improved by EUR 11.4 million compared to year-end 2017. Cash and cash equivalents of EUR 62.7 million on December 31, 2018, and of EUR 58.4 million on December 31, 2017, were invested mainly in EUR, USD and in GBP. At year-end 2018 and 2017, access to EUR 0.3 million of cash and cash equivalents was restricted.

(on December 31, in millions of EUR)	2018	2017
Cash and cash equivalents	62.7	58.4
Financial liabilities		
current	-19.4	-79.1
non-current	-70.1	-17.5
Net liquidity	**-26.8**	**-38.2**

ADVA reports liquidity ratios as follows:

(on December 31)		2018	2017
Cash ratio	Cash and cash equivalents / Current liabilities	0.43	0.31
Quick ratio	Monetary current assets* / Current liabilities	1.11	0.74
Current ratio	Current assets / Current liabilities	1.77	1.23

*Monetary current assets are defined as the sum of cash and cash equivalents, short-term investments and securities and trade accounts receivable.

Return on capital employed

Return on capital employed (ROCE) in 2018 was at 4.8%, essentially up from 1.4% reported in 2017. This development is largely due to the increased operating result reported in 2018.

(base data in millions of EUR)		2018	2017
Operating income		15.0	4.4
Average total assets*		472.7	470.4
Average current liabilities*		163.4	154.8
ROCE	Operating income / Ø total assets – Ø current liabilities	**4.8%**	**1.4%**

*Arithmetic average of five quarterly period-end values (Dec. 31 of the prior year and Mar. 31, Jun. 30, Sep. 30 and Dec. 31 of the year).

Summary: Net assets and financial position

Mainly due to the positive net result and the refinancing of the short-term bridge loan by a syndicated loan with a total maturity of five years the net assets and financial position of ADVA improved in 2018.

Sunil Menon

"Across every ADVA campus throughout the world, our team is united behind one shared goal: empowering our customers to achieve exceptional success."

Transactions with related parties

Transactions with related individuals and legal entities are discussed in notes (39) and (40) to the consolidated financial statements.

Events after the balance sheet date

There were no events after the balance sheet date that materially impacted the net assets and financial position of the group and ADVA Optical Networking SE on December 31, 2018, or the groups and the company's financial performance for 2018. Similarly, there were no events considered material for disclosure.

Performance of ADVA Optical Networking SE

In addition to reporting on the ADVA Optical Networking group, the following sections provides information on the performance of ADVA Optical Networking SE.

ADVA Optical Networking SE is the parent company of the group and performs the group's management and corporate functions. It takes on major group-wide responsibilities such as finance and accounting, corporate compliance and risk management, strategic and product-oriented R&D activities as well as corporate and marketing communications worldwide.

ADVA Optical Networking SE's individual financial statements are prepared in accordance with the German Commercial Code. The complete individual financial statements are published separately.

Branch offices and organization

The company maintains its registered office in Meiningen, Germany. This is also the location of the main production and development facility of the company (351 employees at year-end 2018). Branch offices are located in Berlin, focusing on software development of the company's products (45 employees) and in Martinsried/Munich, where the company maintains its headquarter with all central functions and the sales & marketing organization (126 employees). On December 31, 2018, further branch offices were located in Hanover (10 employees), Courtaboeuf/Paris, France (17 employees), Madrid, Spain (2 employees), Helsinki, Finland (1 employee), Grottaferrata/Rome, Italy (13 employees), Vienna, Austria (3 employees), Zurich, Switzerland (2 employees), Dubai, United Arab Emirates (1 employee) and Centurion/Pretoria, South Africa (4 employees). ADVA is organized according to functional areas across all international locations.

Operational performance

In 2018, ADVA Optical Networking SE generated revenues of EUR 325.5 million, a slight increase of 1.2% compared to prior year's revenues of EUR 321.7 million.

EMEA continued to be the most important sales region in 2018, followed by the Americas and Asia-Pacific. EMEA revenues decreased slightly by 1.2% from EUR 217.6 million in 2017 to EUR 214.9 million in 2018, representing 66.0% of total revenues after 67.6% in 2017. In the Americas, revenues decreased by 18.9% from EUR 81.7 million in 2017 to EUR 66.3 million in 2018. This decrease was mainly due to reduced revenues with subsidiaries. The corresponding share of total annual revenues decreased from 25.4% to 20.4%. In the Asia-Pacific region, revenues were up significantly up by 97.5% from EUR 22.4 million in 2017 to EUR 44.3 million in 2018. The Asia-Pacific region comprised 13.6% of total revenues in 2018 after 7.0% in 2018. This increase is mainly driven by sales to a former customer of the MRV group.

Cost of goods sold decreased from EUR 209.6 million in 2017 to EUR 201.8 million in 2018, decreasing the share in total revenue from 65.2% to 62.0% in 2018.

Gross profit increased from EUR 112.1 million or 34.8% of revenues in 2017 to EUR 123.7 million or 38.0% of revenues in 2018. The development of the gross margin is impacted by variations in regional revenue distribution and in product and customer mix.

Selling and marketing expenses increased from EUR 30.7 million in 2017 to EUR 32.3 million in 2018. General and administrative expenses decreased to EUR 14.7 million from EUR 16.8 million in 2017. Considering capitalization of development expenses, decreasing from EUR 39.0 million in 2017 to EUR 31.9 million in 2018, research and development expenses totaled EUR 91.6 million or 28.1% from revenues compared to EUR 73.7 million or 22.9% from revenues in the prior year. The increase mainly results from higher recharges of subsidiaries. Other operating result (other operating income less other operating expenses) declined to EUR 0.6 million from EUR 1.6 million in 2017.

The company generated a net loss after tax of EUR 14.5 million in 2018, compared to a net loss after tax of EUR 7.5 million in 2017.

Summary: Business development and operational performance

Overall, the business development and operational performance declined, mainly driven by a disproportional increase in operating expenses offset partly by the increase in gross profit.

Net assets and financial position

ADVA Optical Networking SE's balance sheet total increased by EUR 12.8 million from EUR 322.7 million at year-end 2017 to EUR 335.5 million at year-end 2018. Non-current assets decreased from EUR 211.0 million to EUR 199.9 million on December 31, 2018, representing 59.6% of total assets after 65.4% at the end of the previous year. Current assets increased to EUR 134.5 million from EUR 110.0 million in 2017, representing 40.1% of total assets after 34.1% at the year-end 2017.

The decline in non-current assets was mainly driven by a decrease in financial assets of EUR 25.5 million to EUR 73.4 million, partly offset by an increase in intangible assets with EUR 13.8 million to EUR 115.2 million.

Mainly due to the net loss reported in the current year, stockholders' equity decreased from EUR 148.7 million at year-end 2017 to EUR 135.0 million at year-end 2018 and represented 40.2% of the balance sheet total after 46.1% at the end of 2017. Liabilities increased from EUR 146.5 million to EUR 168.5 million. The increase in liabilities is primarily due to the increase of liabilities to affiliated companies of EUR 18.5 million as well as the increase in trade accounts payables of EUR 10.0 million. This was partly offset by a decrease of liabilities to banks of EUR 6.6 million. Provisions increased from EUR 12.0 million in 2017 to EUR 15.2 million in 2018 mainly due to higher outstanding invoices related to material purchases.

Capital expenditures

Total capital expenditures amounted to EUR 60.0 million in 2018 (prior year: EUR 105.8 million). Thereof, EUR 4.3 million (prior year: EUR 3.5 million) were attributable to property, plant and equipment, EUR 50.5 million (prior year: EUR 43.7 million) to intangible assets and EUR 5.2 million to financial assets (prior year: EUR 58.6 million). Investments in property, plant and equipment mainly relate to measuring and test equipment. Investments in intangible assets relate to purchase of new technologies and intellectual property rights.

Financial assets relate primarily to shares in and loans to affiliated companies. Prior year capital expenditures for financial assets was predominantly impacted by the acquisition of the MRV group.

Liquidity

The development of cash and cash equivalents is analyzed in as follows:

(in millions of EUR)	2018	2017
Operating cash flow	39.9	25.1
Investing cash flow	-29.2	-75.9
Financing cash flow	-6.8	36.9
Net change in cash and cash equivalents	**3.9**	**-13.9**
Cash at banks and in hand at the beginning of the year	7.4	21.3
Cash and cash equivalents at the end of the year	**11.3**	**7.4**

During 2018 and 2017, the company was able to meet all payment obligations.

Cash and cash equivalents of EUR 11.3 million on December 31, 2018, and of EUR 7.4 million on December 31, 2017, were denominated mainly in EUR and USD. Due to the increase in cash and cash equivalents and the decrease in liabilities to banks in 2018, ADVA Optical Networking SE´s net liquidity increased from negative EUR 89.2 million in 2017 to negative EUR 78.7 million in 2018.

Financing

Liabilities to banks decreased from EUR 96.6 million at year-end 2017 to EUR 90.0 million at the end of 2018. In 2018, a short-term bridge financing facility for the acquisition of the MRV Communications group, was refinanced via a syndicated loan of nominal EUR 65.0 million with a total maturity of five years. Further information on this loan and on the covenants agreed can be found in notes (16) and (34) of the consolidated financial statements. All financial liabilities were exclusively denominated in EUR at the end of 2017 and 2018.

On December 31, 2018, the company had available EUR 10.0 million (on December 31, 2017: EUR 8.0 million) of undrawn committed borrowing facilities in respect of which all conditions had been met.

The following table provides an overview of interest terms and the maturity of each financial liability at year-end 2018:

(in millions of EUR)	Dec. 31, 2018	Maturity		
		≤ 12 months	13 – 36 months	> 36 months
IKB Deutsche Industriebank loans	12,5	6,25	6,25	-
	5,0	2,5	2,5	-
	7,5	3,75	3,75	-
Syndicated loan	65,0	6,0	21,0	38,0
Total financial liabilities	**90,0**	**18,5**	**33,5**	**38,0**

Dividend payments

In 2018 there were no dividend payments for 2017 (prior year: nil for 2016). ADVA Optical Networking SE does not plan to pay out a dividend for 2018.

Summary: Net assets and financial position

While increasing its net liquidity during 2018, the company's net assets declined.

Share capital and shareholder structure

On December 31, 2018, ADVA Optical Networking SE had issued 49,930,955 no par value bearer shares (December 31, 2017: 49,735,549). The common shares entitle the holder to vote at the Annual Shareholder´s Meeting and to receive dividends in case of a distribution. No restrictions are attached to the common shares. No other class of shares had been issued during the reporting period.

At year-end 2018, EGORA Holding GmbH held a total of 7,456,749 shares or 14.93% of all ADVA Optical Networking SE shares outstanding (at year-end 2017: 7,456,749 shares or 14.99% of all shares outstanding). 5,930,902 of these shares or 11.88 % of all shares outstanding (at year-end 2017: 5,930,902 shares or 11.92% of all shares outstanding) were held by EGORA Ventures GmbH, a 100% subsidiary of EGORA Holding GmbH, and the remaining 1,525,847 shares or 3.05% of all shares outstanding (at year-end 2017: 1,525,847 shares or 3.07% of all shares outstanding) were held directly by EGORA Holding GmbH. Both EGORA companies have their registered offices in Fraunhoferstrasse 22, 82152 Martinsried/Munich, Germany. Additionally, at year-end 2018, Teleios Capital Partners LLC, registered office Baarerstraße 12 in 6300 Zug, Switzerland, held 10,104,243 shares or 20.25%* of all ADVA Optical Networking SE shares outstanding (at year-end 2017: 7,469,936 shares or 15.02%). No other shareholder has filed with the company to have held more than 10% of the company's shares outstanding on December 31, 2018. Further details on share capital and shareholder structure are disclosed in note (21) to the consolidated financial statements.

* Capital shares refer to the total number of voting rights at the respective notification date. A change in the total number of voting rights after the notification date was not taken into account.

Restriction of voting rights and share transfers

At year-end 2018, the management board of ADVA Optical Networking SE had no knowledge of any restrictions related to voting rights or share transfers.

Appointment and dismissal of management board members

The appointment and dismissal of members of the management board of ADVA Optical Networking SE follows the direction of the German Stock Corporation Act (Aktiengesetz, AktG), the German SE Implementation Act (SE-Ausführungsgesetz, SEAG) as well as the provisions in section 6 of the company's current articles of association as of February 8, 2019. According to these articles, in principle the supervisory board appoints the members of the management board and does so for a maximum period of five years. However, it is the company's practice to appoint the members of the management board for two years only. Repeated appointment is possible. According to the company's articles of association, the management board of ADVA Optical Networking SE shall regularly consist of two individuals and the supervisory board shall have the right to determine and appoint a higher number of individuals. If the management board consists of more than one individual, the supervisory board may appoint one member of the management board chief executive officer or speaker of the management board, and another member his or her deputy. The supervisory board may recall an already-effective appointment for important reasons. In 2018, no appointments or dismissals of management board members were affected. ADVA Optical Networking SE's management board consisted of Brian Protiva (chief executive officer), Christoph Glingener (chief technology officer), Ulrich Dopfer (chief financial officer) and Scott St. John (chief marketing & sales officer) throughout the year.

Changes to articles of association

Following article 9 SE Regulation in conjunction with section 50 SEAG, amendments to the articles of association of ADVA Optical Networking SE are made pursuant to section 179 AktG in conjunction with Section 133 AktG, as well as the provisions in section 4 para. 6 and section 13 para. 3 of the current articles of association of the company dated February 8, 2019. Accordingly, in principle any changes to the articles of association other than purely formal amendments need to be resolved by the shareholders' meeting. However, the shareholders' meeting has authorized the supervisory board to change the version of the articles of association in accordance with capital increases from authorized capital and conditional capital.

Issuance and buy-back of shares

The rights of the management board to issue new shares are regulated in section 4 paragraphs 4 and 5k of the articles of association as of February 8, 2019, of ADVA Optical Networking SE. According to ADVA Optical Networking SE's current articles of association the management board is authorized with approval of the supervisory board to increase the capital stock by up to 24,048,215 new shares from authorized capital, amounting to a total of EUR 24,048,215 against cash or contribution in kind with possible exclusion of subscription rights (authorized capital 2015/I). As of December 31, 2018, the authorized capital amounted to EUR 24,048,215, so that at that time the management board have been capable of issuing up to 24,048,215 shares, commensurate to 48.16% of total shares outstanding. In addition, as of December 31, 2018, a conditional capital of EUR 4,973,554 were recorded

in the commercial register (conditional capital 2011/I). The conditional capital can only be used for granting stock option rights to members of the management board, to employees of the company and to management and employees of affiliated companies. The conditional capital increase is put into effect only if, when and insofar the holders of the option rights exercise these rights. 195,406 new shares were already created in 2018 as a result of the exercise of stock options, but will only be registered in the trade register after the balance sheet date. Thus, the number of shares that can be issued by the management board from the two tranches of conditional capital is reduced to 4,778,148.

At year-end 2018, the management board was authorized to buy back up to a total of 10.0% of the existing share capital at the time of resolution by the annual general meeting or – if this value is lower – at the time the authorization will be exercised. This right was granted to the management board by a resolution of the shareholders' meeting on May 20, 2015 until May 19, 2020. Shares bought back may be used for all legally permitted purposes, in particular as consideration for the acquisition of companies, parts of companies or investments in companies, for issuing stock to employees of the company or affiliated companies, for serving share subscription rights from the company's stock option plans, and for redeeming the shares pursuant to the legal provisions.

Takeover bid-driven change of control provisions

At year-end 2018, a bilateral loan with redemption value of nominally EUR 12.5 million (repayable in 16 equal quarterly installments since March 2017), a bilateral loan with redemption value of nominally EUR 5.0 million (repayable in 16 equal quarterly installments since March 2017), a bilateral loan with redemption value of nominally EUR 7.5 million (repayable in 12 equal quarterly installments since March 2018), and a syndicated loan with a redemption value of nominally EUR 65.0 million (repayable in half-yearly installments as well as a final installment on the due date from June 2019), respectively, are part of ADVA Optical Networking SE's financial liabilities. In addition, the syndicated loan has an undrawn credit line of EUR 10.0 million at the reporting date. In the event of a potential takeover bid-driven change in control of ADVA Optical Networking SE, the creditors have the right to terminate these loans with immediate effect.

As of December 31, 2018, for the event of a takeover bid-driven change in control there have been no recourse agreements in place with any of the members of the management board or with any of the group's employees.

Declaration on corporate governance and corporate governance report

Compliance with the rules of proper corporate governance is of great importance to ADVA, it is the foundation for the group's success. According to section 289f and § 315d of the German Commercial Code (Handelsgesetzbuch, HGB), ADVA Optical Networking SE is obliged to publish a "declaration on corporate governance", and section 161 of the German Stock Corporation Act (Aktiengesetz, AktG) in connection with section 3.10 of the German Corporate Governance Code as amended on February 7, 2017, recommends that management board and supervisory board shall prepare a "corporate governance report". In order to facilitate public access to all respective data, ADVA integrates the "declaration on corporate governance" and the "corporate governance report" into one single publication on its website www.advaoptical.com (About us/Investors/Corporate governance).

Nonfinancial report

In order to facilitate public access to all respective data, ADVA decided to publish a separate nonfinancial report on its website www.advaoptical.com (About us/Sustainability) until April 30, 2019.

Definition of aims and terms for the rise of the women portion in the supervisory board, the management board and in both leadership levels below the management board

Following the entry into force of the “Law on Equal Participation of Women and Men in Management Positions in the Private and Public Sector” (FüPoG), the supervisory board of ADVA Optical Networking SE had set a target of 33.33% for the company’s supervisory board, and a target of 0% for the management board of the company, both to be achieved by June 30, 2017. As of June 30, 2017, the proportion of women on the supervisory board of ADVA Optical Networking SE has been 33.33% and on the management board 0%. So, both targets were achieved. For the following period, the supervisory board determined at its meeting on November 15, 2017, that a women’s portion of 33.33% in the supervisory board shall be maintained until March 31, 2021, and a women’s portion of 0% in the management board until December 31, 2021. As of December 31, 2018, these shares have already been realized.

Following the entry into force of the FüPoG, the management board of ADVA Optical Networking SE had set an 8% women’s share for the first management level and a 30% women’s share for the second management level below the management board; both to be achieved by June 30, 2017. As of June 30, 2017, the women’s portion on the first management level has been 7%, and 32% on the second management level, exceeding the self-imposed target on the second management level, but slightly missing the self-imposed target of the first management level. This was due to an in-house change of a reporting line that lifted a male executive from the second to the first management level; besides that, the management structure and team remained unchanged at both management levels. For the following period, ADVA Optical Networking SE’s management board has set a target of 7% for the women’s share on the first level of management and of 30% on the second level of management below management board, both to be achieved until June 30, 2022. As of December 31, 2018, the women’s portion on the first management level has been 13%, and 31% on the second management level; thus, these shares have already been realized.

Remuneration of the management and the supervisory board

The compensation of ADVA’s management board members consists of fixed and variable components. In addition to a fixed salary, the members of the management board receive two kinds of variable compensation which are assessed based either on short-term aspects or on long-term criteria focusing on the sustainable development of the group. As additional long-term variable compensation, the management board members receive stock options within the scope of ADVA ’s stock option program. The compensation for the members of the management board includes capped variable compensation components (short-term variable compensation, long-term variable compensation, newly issued options), and provides upper and lower limits for the four targets of the short-term variable compensation.

In 2018, the fixed salaries of all members of the management board remained unchanged. The short-term variable compensation of all four members of the management board was based on the group’s pro forma operating income (40%), the group’s revenues (20%), and the group’s net liquidity (20%) as well as individual goals agreed with each member of the management board at the beginning of the year (20%). The short-term variable compensation is determined annually as compensation for the current year at the discretion of the supervisory board. Furthermore, a long-term variable compensation focusing on the sustainable development of the group was agreed which will be paid to the members of the management board after three years, provided that a year-by-year increased minimum group pro forma operating income is met for each of the three years. All members of the management board additionally receive a company car or a car allowance. Moreover, ADVA bears the costs of the directors & officers liability insurance for the management board members, taking into account the statutory deductible amount. These benefits are partially taxable by the members of the management board as non-cash benefits. In addition, ADVA grants stock options to members of the management board. These option rights authorize the members of the management board to purchase a set number of shares in the company once a fixed vesting period has elapsed and the goal to increase the share price by at least 20% has been reached.

Total management board compensation payable for 2018 and 2017 was EUR 2,099 thousand and EUR 1,538 thousand, respectively. During both years, there were no long-term service contracts in the sense of IAS 19 for any member of the management board. In 2018 and 2017, no loans were granted to the members of the management board. As of December 31, 2018 and 2017, no receivables outstanding from members of the management board have been reported.

Value of benefits granted for the reporting period

	Brian Protiva				Christoph Glingener				Ulrich Dopfer				Scott St. John			
	Chief executive officer				Chief technology officer				Chief financial officer				Chief marketing & sales officer (from October 1, 2017)			
(in thousands of EUR)	2018	2017	2018 (Min)	2018 (Max)	2018	2017	2018 (Min)	2018 (Max)	2018	2017	2018 (Min)	2018 (Max)	2018	2017	2018 (Min)	2018 (Max)
Fixed compensation	253	253	253	253	253	253	253	253	253	253	253	253	253	63	253	253
Fringe benefits	11	14	11	11	14	13	14	14	20	18	20	20	20	5	20	20
Total	**264**	**267**	**264**	**264**	**267**	**266**	**267**	**267**	**273**	**271**	**273**	**273**	**273**	**68**	**273**	**273**
Short-term variable compensation (1 year)	221	167	-	536	150	113	-	361	142	101	-	340	142	28	-	360
Multi-year variable compensation:																
Long-term variable compensation (3 years)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stock option plans (7 years)	157	-	-	6,700	-	-	-	6,500	-	-	-	5,133	210	257	-	5,000
Total	**642**	**434**	**264**	**7,500**	**417**	**379**	**267**	**7,128**	**415**	**372**	**273**	**5,746**	**625**	**353**	**273**	**5,633**

Actual contribution for the reporting period

	Brian Protiva				Christoph Glingener				Ulrich Dopfer				Scott St. John			
	Chief executive officer				Chief technology officer				Chief financial officer				Chief marketing & sales officer (from October 1, 2018)			
(in thousands of EUR)	2018	2017	2018 (Min)	2018 (Max)	2018	2017	2018 (Min)	2018 (Max)	2018	2017	2018 (Min)	2018 (Max)	2018	2017	2018 (Min)	2018 (Max)
Fixed compensation	253	253	253	253	253	253	253	253	253	253	253	253	253	63	253	253
Fringe benefits	11	14	11	11	14	13	14	14	20	18	20	20	20	5	20	20
Total	**264**	**267**	**264**	**264**	**267**	**266**	**267**	**267**	**273**	**271**	**273**	**273**	**273**	**68**	**273**	**273**
Short-term variable compensation (1 year)	221	167	221	221	150	113	150	150	142	101	142	142	142	28	142	142
Multi-year variable compensation:																
Long-term variable compensation (3 years)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stock option plans (7 years)	-	-	-	-	-	-	-	-	9	-	9	9	-	-	-	-
Total	**485**	**434**	**485**	**485**	**417**	**379**	**417**	**417**	**424**	**372**	**424**	**424**	**415**	**96**	**415**	**415**

The compensation of the members of ADVA's supervisory board, beyond the reimbursement of out of pocket expenses, only consists of fixed compen-sation paid out quarterly.

The total compensation payable to the members of ADVA's supervisory board for 2018 amounted to EUR 235 thousand, after EUR 235 thousand for 2017.

Furthermore, ADVA bears the cost of the directors & officers liability insurance for all members of the supervisory board. During 2018, no loans or advance payments were granted to members of the supervisory board.

Detailed information on the compensation structure of the individual members of the management and supervisory boards can be found in note (40) to the consolidated financial statements.

Griz Calderon
Christian Rieder

"A passion for helping customers and communities achieve their full potential is at the heart of everything we do. We believe in the potential of connectivity to empower people and enrich lives."

Employees

On December 31, 2018, ADVA had 1,886 employees worldwide, including 31 apprentices (prior year: 1,894 including 27 apprentices).

On average, ADVA had 1,856 employees during 2018, down from 1,858 in 2017. Furthermore, there were 24 and 19 temporary employees working for ADVA at year-end 2018 and 2017, respectively.

Personnel expenses in the group increased from EUR 171.6 million in 2017 to EUR 173.0 million in 2018, representing 33.4% and 34.5% of revenues, respectively.

On December 31, 2018, ADVA Optical Networking SE had 575 employees, thereof 30 apprentices (prior year: 572 employees, thereof 27 apprentices). This corresponds to an increase of 3 employees or 0.5% versus the end of the prior year.

The breakdown of employees of ADVA SE by functional area is as follows:

(on December 31)	2018	2017	Change
Purchasing and production	161	157	+4
Sales, marketing and service	116	118	-2
Management and administration	81	85	-4
Research and development	187	185	+2
Apprentices	30	27	+3
Total employees	**575**	**572**	**+3**

Personnel expenses in the ADVA SE decreased from EUR 47.9 million in 2017 to EUR 46.8 million in 2018, representing 14.4% of revenues in 2018 compared to 14.9% in 2017.

The employee compensation packages comprise fixed and variable elements and include stock options. These compensation packages enable employees to participate appropriately in the success of the group, and support employee retention, while at the same time rewarding individual efforts, teamwork, innovation and productivity. Furthermore, employees who perform exceptionally well, or who make suggestions for significant improvements are recognized through the group's spot award program. In addition, the group is committed to offering all employees comprehensive on-the-job training, as well as specific continuing education opportunities in order to advance their personal and professional development.

The group offers different types of continuing education programs through the ADVA university, based on employee development needs. These needs are identified, documented, and reviewed semi-annually, within an electronic performance appraisal and competency management system.

Within ADVA, all relevant local regulations for health and safety in the workplace are complied with, and in some countries are regularly monitored by independent engineering offices for safety in the workplace.

ADVA is committed to the creation of a workplace free of discrimination and harassment. The group recruits, hires, trains and promotes individuals on all job levels without regard to race, religion, ancestry, sexual orientation, marital status, national origin, age, gender and physical or mental disability. ADVA is committed to a fair and equitable workplace where everyone is a respected and valued member of the team. The group's core values (teamwork, excellence, accountability and motivation) and leadership principles (integrity & honesty, decisiveness and respect) guide employees and managers in all business activities.

An efficient employee representation without trade union ties is in place on a global basis, reflecting the international employee base and overall orientation of the group.

At its main production and development facility in Meiningen, Germany, ADVA currently provides 30 apprenticeship positions, whereof 17 lead to professions as electronic technician for devices and systems, office management assistant and as specialist for warehouse logistics. In Meiningen, Germany, the company is among the most recognized apprenticeship providers for industrial electronics professions in its region. In addition, ADVA offers a dual study program in Germany that provides on-the-job work experience to students pursuing degrees. Currently 12 students are trained within this program.

Risk report

ADVA's future development offers a broad variety of opportunities. It is however also subject to various risks, which in certain cases could endanger the group's continued existence. The management board has implemented a comprehensive risk management and internal control system that enables the detection of risks in a timely manner and allows the group to take corrective action and to benefit from identified opportunities. An integral aspect of the group's strategy is its ability to anticipate developments in the marketplace and future customer needs. Special emphasis is given to product development, the quality of the group's products and the validation, selection and oversight of key business partners.

Risk management system

Since ADVA was founded in 1994, its business has become more diversified. The group markets its products and solutions in part via a variety of distribution partners but has become less dependent over the years due to continued investment in a direct distribution model in core geographies. Beyond focusing on enhancing revenue predictability, a comprehensive risk management system has been established. The risk management system is subject to scheduled reviews by the group's internal audit function.

Being a globally operating company, ADVA implemented its risk management system on the basis of applicable laws and regulations such as Germany's BilMoG and KonTraG and by taking into account common international standards and best practices such as the COSO framework and the ISO 31000 auditing standard. It is closely integrated with supporting management systems such as the group's compliance management system. The management board nevertheless recognizes that a risk management system cannot in all cases prevent the occurrence of events that may cause material damage to the group.

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ADVA's strategic goals are the basis for its risk management system. These goals are organized into four areas, growth and profitability, innovation, operational excellence and people. The strategic goals are reviewed by the management board and the supervisory board on a yearly basis and amended where appropriate. They also constitute the basis for the group's three-year business plan, which is reviewed and updated annually. Each of these goals is defined in detail and then broken down into specific departmental and individual targets. The strategic goals are traced to each employee, so that every individual can focus and be evaluated on his/her own performance and contribution to ADVA's overall success.

ADVA measures the accomplishment of its strategic goals against revenues, pro forma operating income and net liquidity as well as the non-financial criterion of customer satisfaction measured by the net promoter score. These metrics represent the group's key performance indicators. The management board sets target values for all four metrics for the year to come and measures actual values against the target values: revenues and pro forma operating income on a monthly basis, net liquidity on a quarterly basis and the net promoter score on an annual basis. Corrective action is taken quickly should a deviation from the plan occur or be reasonably predicted to occur. This information is summarized and communicated to the management board in monthly, quarterly and yearly reports.

Moreover, budgets are reviewed on a monthly basis and adjustments are made if necessary. The group's accounting, controlling and treasury departments provide globally consolidated reports on available cash funds and the development of margins and current assets (e.g. inventories and receivables) on a monthly and quarterly basis. These reports also include budgeted/forecast and actual revenues and expenditures. The structure and content of these reports is continuously adapted to the most current requirements.

ADVA regularly monitors the credit-worthiness of all customers and updates credit limits as needed. Material expenditures and investments must be approved in advance through an electronic purchase order system. In conjunction with continuously updated revenue and cash forecasts, a detailed monthly preview of anticipated group development within the next three to twelve months is produced and communicated to the management board. Moreover, the group's accounting, controlling and legal departments review potential legal and litigation risks on a quarterly basis in order to obtain a reliable estimate of the potential loss, taking into account all relevant information and expectations. Finally, ADVA's management board discusses all significant business transactions with the supervisory board and obtains its approval if necessary.

In order to ensure observance of all applicable laws and regulations and to support the group's ongoing growth and internationalization, the management board implemented a combined risk management and compliance function. Key compliance measures include a code of conduct, a range of group-wide policies, the training of employees and the active encouragement to report suspected incidents of non-compliance and to seek support when having questions. All implemented measures and processes for risk management as well as compliance are continuously reviewed and improved. In 2017 the group had implemented improved processes for risk identification and quantification which were continued and further refined throughout 2018.

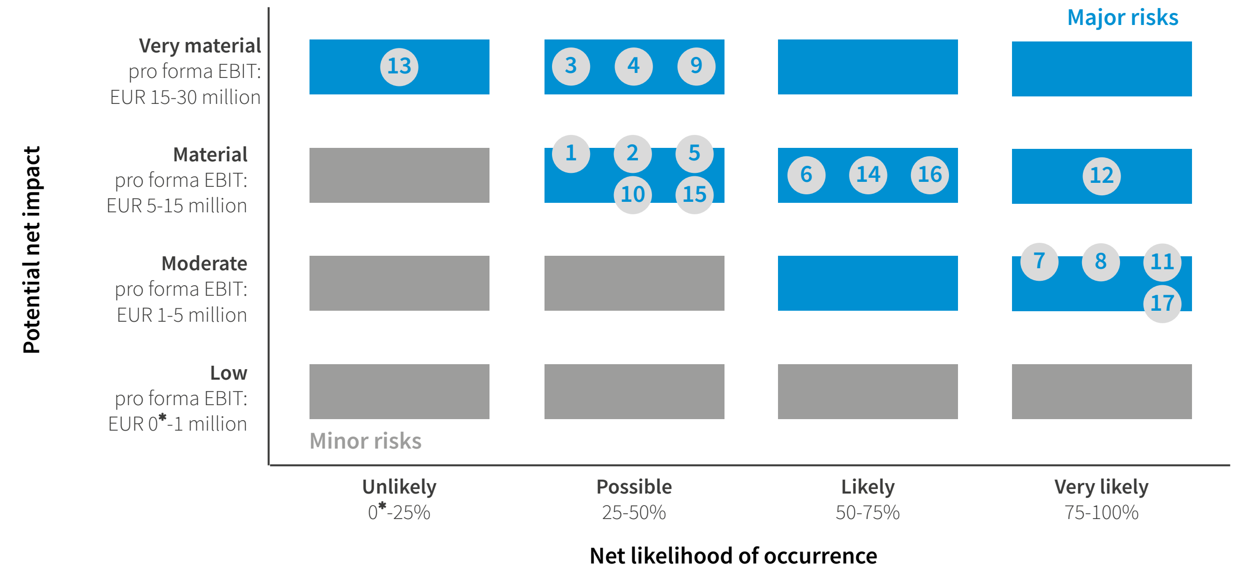
ADVA differentiates between two main categories of risks and opportunities – those considered major and those considered non-material. A risk or opportunity is considered major if its expected net impact on the group's pro forma operating income exceeds EUR 1 million in terms of ADVA's three-year business plan. If not attributable to the pro-forma operating income, the group's net income is used as reference. The expected net impact is calculated by multiplying the potential net impact of a particular risk or opportunity with its net likelihood of occurrence. For each major risk the group assigns a dedicated risk owner who is responsible for defining and implementing an adequate and effective response for risk mitigation. Adherence with this process is monitored by the group's compliance function which conducts structured reviews with each risk owner according to a defined schedule and at a minimum three times per year. Should any such major risk materialize, the assigned risk owner has the responsibility to immediately report this to the management board. Independent of specific risk ownership, all employees of ADVA are asked to escalate additional obvious risk items directly and informally to the group's compliance function and the chief financial officer. Risk identification and reporting is supported by monthly reports and regular webinars in which the management board informs the global management team about the current business development, outlook and goals.

Based on the outlined analytical tools and processes, ADVA ranked 17 risks as major risks at the end of 2018 (end of 2017: 16), which are discussed in detail below.

The risks and opportunities of ADVA Optical Networking SE essentially correspond to those of the group. In addition to the risks listed here, there is also a risk with regard to the recoverability of shares in affiliated companies. ADVA Optical Networking SE does do not consider this risk to be material.

Major risks 2019-2021

1 Loss of key customers or channel partners
2 Decrease in standard margin (STM)
3 Wrong product strategy
4 Uncompetitive product cost
5 Uncompetitive products due to delayed release
6 Product design quality and regulatory compliance
7 Alleged intellectual property infringements by ADVA
8 Alleged intellectual property infringements by supplier
9 Supplier and manufacturing quality
10 Supply shortages
11 U.S. – China trade conflict
12 IT security
13 Foreign currency fluctuations
14 Compliance violations by intermediaries
15 Bribery
16 Loss of knowledge, skills, relationships and overall capacity
17 Harassment or discrimination claims or proceedings



* Defined minimum thresholds for risk reporting

Growth and profitability risks

LOSS OF KEY CUSTOMERS OR CHANNEL PARTNERS (POSSIBLE; MATERIAL)

The loss of key customers or channel partners would have significant impact on ADVA's business. This risk may originate to some extent from changes in customer demands and the group's ability to meet these requirements reliably and in a timely manner. Additionally, mergers and acquisitions have the potential to negatively impact the group should this result in the decision to consolidate vendors and technology partners in a way that either reduces ADVA's share of the customer spend or eliminates the use or distribution of the group's solutions. However, for most key revenue customers, the group has deployed thousands of systems over a multi-year period and, as a result, there is a certain dependency with these customers and the related channel partner on ADVA and its products, which are integrated into the customer's workflows and processes. For key customers and channel partners, the group furthermore ensures continuous performance and satisfaction through a dedicated team of professionals.

DECREASE IN MARGINS (POSSIBLE; MATERIAL)

Procurement is a key focus area for customers and their cost-saving initiatives. Purchases, especially for multi-year projects are often conditioned on gradual price decreases. In addition, several products are essentially being commoditized with many competing vendors. The group has many preventive action plans in place. Most important is its focus on innovation. In order to successfully defend higher prices, the group consistently pushes the limits of new technology in its products, improves its processes, and communicates the value, reliability, scalability, cost-effectiveness, performance and technological leadership of its solutions to all of its customers.

Innovation risks

WRONG PRODUCT STRATEGY (POSSIBLE; VERY MATERIAL)

The market for innovative connectivity solutions for cloud and mobile services is highly competitive and subject to rapid technological change. Competition in this market is characterized by various factors, such as price, functionality, service, scalability and the ability of systems to meet customers' immediate and future network requirements. Should ADVA be unable to quickly adapt to changing market conditions, customer requirements or industry standards, the group's development would be impacted negatively. Since some of the group's competitors operate in a broader market and have considerably more resources available due to their greater size, ADVA must continue to focus its efforts on those technologies and features that are expected to supersede the current ones. The likelihood of wrong development decisions is minimized by a series of preventive actions that include running advanced technology projects, running a team of navigators to decide on strategic direction, industry and competitor analysis, keeping the group's development roadmap up-to-date, testing product visions with customers, monitoring and influencing standardization and staying close to customers in order to identify differentiating technology opportunities. In addition, the group has implemented a highly flexible and adaptive development organization and processes to quickly adjust to changing requirements.

UNCOMPETITIVE PRODUCT COST (POSSIBLE; VERY MATERIAL)

ADVA achieves cost leadership through its ability to scale economically and through the optimization of product design. The loss of cost leadership would drastically reduce the group's success in winning new business and would have a negative effect on gross and operating margins. The significant pricing pressure for innovative connectivity solutions must be met strategically by improving processes, controls and technology while maintaining adequate R&D budgets, as well as operationally by achieving cost leadership in sourcing product components. A dedicated team identifies competitive price and cost targets for new products, monitors product cost changes throughout the development process and negotiates, tracks and forecasts product and related component costs. Achievement of the group's annual cost reduction targets for sourcing components is supported by monthly and quarterly status reports to the group's management board.

UNCOMPETITIVE PRODUCTS DUE TO DELAYED RELEASE (POSSIBLE; MATERIAL)

High competition and rapid technological change are the decisive characteristics of the market for innovative connectivity solutions for cloud and mobile services. Continuous success not only requires the identification of innovative solutions for future network and customer requirements by maintaining cost leadership, but to also release such innovations at the projected time as delays may undermine their competitiveness. As a result, ADVA implemented a joint development and operations organization ("DevOps") clustered into technology value streams in order to maximize effectiveness and break up barriers. All streams thereby operate according to one common tool-supported development process.

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PRODUCT DESIGN QUALITY AND REGULATORY COMPLIANCE (LIKELY; MATERIAL)

Increasing pressure on product development timelines and growing product complexities that need to be supported by limited R&D resources present challenges for product design quality and regulatory compliance. While timelines are largely driven by market and customer demands, the increase in product complexity is due to a variety of different factors, including technical requirements, legacy infrastructure, and the desire to address the needs of a maximum number of ADVA's growing customer base. For risk mitigation, the group implemented a tool-supported development process with clearly defined requirements for each development stage, realistic project planning including adequate risk management, and consistent and comprehensive testing during all development phases supported by transparent reporting of the achieved quality levels.

ALLEGED INTELLECTUAL PROPERTY INFRINGEMENTS BY ADVA (VERY LIKELY; MODERATE)

Third parties may assert that ADVA has violated their intellectual property rights and claim license fees, indemnities or a discontinuation of production and marketing of affected products. Related disputes could result in considerable cost to ADVA, while also diverting management and technical resources. For mitigation, the group has implemented adequate guidelines to avoid infringements in the first place. ADVA also uses and continuously extends its own patent portfolio as defense. A dedicated team is available to assess and appropriately act on any asserted intellectual property infringement.

ALLEGED INTELLECTUAL PROPERTY INFRINGEMENTS BY SUPPLIER (VERY LIKELY; MODERATE)

Besides ADVA itself, the group's suppliers may also be approached by third parties claiming intellectual property infringements. As a consequence, the group may be unable to source a particular component as required for its own solutions. To protect against such risk, ADVA's contract templates include intellectual property provisions to ensure authorized use of third-party intellectual property and to indemnify the group against the resulting damage of any infringement. In addition, multi-sourcing of components is pursued wherever technologically and economically feasible.

Operational excellence risks

SUPPLIER AND MANUFACTURER QUALITY RISKS (POSSIBLE; VERY MATERIAL)

ADVA's product quality is significantly influenced by its suppliers and contract manufacturers. Failure of a single part may cause the whole system to be dysfunctional. Early detection of component as well as production deficiencies is thus critical for the group's success. Deteriorating quality could not only lead to delays in installation, return of products or cancellation of orders, but also to penalties and lawsuits, contract terminations and liability claims. Preventive actions to avoid quality deterioration include close collaboration with key suppliers during the development of critical components, structured and tool-based processes for supplier and manufacturer identification and qualification, robust contracting including adequate indemnifications, and regular audits of key suppliers and all manufacturers.

SUPPLY SHORTAGES (POSSIBLE; MATERIAL)

ADVA sources product components either based on forecasts or upon receipt of a customer purchase order. Any shortage in the required material can thus have a significant negative impact on the group's performance. For mitigation, ADVA implemented tool-based processes for demand forecasting as well as the structured identification and consistent monitoring of suppliers, in particular suppliers of single source components. This includes the introduction of alternatives during the design phase of a new product.

U.S. – CHINA TRADE CONFLICT (VERY LIKELY; MODERATE)

A substantial number of components for the group's solutions as well as the final assembly of various product lines originates or takes place in China. Throughout 2018, the U.S. and China introduced tariffs covering roughly 80% of the U.S. export volume to China and more than 50% of the Chinese export volume to the U.S. Covered product categories include the group's switching and routing solutions originating in China and exported to the U.S. While a temporary agreement to refrain from any additional tariffs was reached between the U.S. and China towards the end of 2018, there is a significant risk of a further escalation which may result in additional costs for ADVA depending on its ability to pass-on any such increases to its suppliers and customers.

IT SECURITY RISKS (VERY LIKELY; MATERIAL)

Stolen credit card information, personal data and business data from major companies have become the topic of frequent business headlines. Unauthorized access to the group's information systems and confidential data can not only cause material damage but also result in penalty payments for violating the EU GDPR. ADVA implemented technical and non-technical means to reduce its IT security risk exposure, e.g., by investing in IT security resources and by implementing a variety of technological and process-based safe-guards, including a so-called "business continuity" solution.

FOREIGN CURRENCY RISKS (UNLIKELY; VERY MATERIAL)

Due to a major portion of the group's revenues and costs being generated in foreign currencies, ADVA's profit is particularly subject to fluctuations in the EUR/USD, GBP/USD, EUR/ILS and EUR/PLN exchange rates. In 2018, on a net basis, the group realized significant GBP inflows and USD outflows. To combat fluctuations, the USD net cash flows are in part hedged against GBP using forward exchange agreements. The duration of such agreements follows ADVA's communication to the capital markets. With the acquisition of MRV Communications in 2017, the group substantially decreased its exposure in USD however increased its risk exposure towards ILS due to material development activities in this region. Information on the sensitivity of the group's net income to fluctuations in foreign exchange rates is provided in note (33) to the consolidated financial statements.

People risks

COMPLIANCE VIOLATIONS BY INTERMEDIARIES (LIKELY; MATERIAL)

ADVA markets its products and solutions in part via a variety of distribution partners due to required economies of scale, local (legal) requirements and in order to benefit from existing contractual as well as personal relationships and post-sale support organizations. While the group's ability to control the partners' activities are limited, compliance violations by intermediaries may, under specific circumstances, be attributed to ADVA. For mitigation, ADVA implemented robust risk-based due diligence procedures including upfront vesting of new intermediaries and periodic reviews and updates. Furthermore, resale contracts include robust compliance representations. Commission-based setups are tightly controlled and avoided where possible.

BRIBERY (POSSIBLE; MATERIAL)

ADVA markets its products and services around the world. In recent years, its customer base and operational setup have become substantially more international. To ensure ethical behavior in all business situations, robust procedures and controls were implemented. If violated, the consequences for the group could be severe, including material fines, the breach of customer contracts and a general loss of reputation. ADVA has a dedicated anti-corruption program in place, which is based on a strong tone from the top and supported by a central compliance department and dedicated regional compliance officers, means for (anonymous) reporting of concerns, tight controls on all financial transactions, continuous and risk-based monitoring of activities and the periodic auditing of all implemented measures through an independent function.

LOSS OF KNOWLEDGE, SKILLS, RELATIONSHIPS AND OVERALL CAPACITY (LIKELY; MATERIAL)

Solid economic growth coupled with rapid digital transformation has led to shortages of skilled workers within the technology industry and companies are vying for each other's talent. While particularly intense in developed countries, competition for talent has increased all over the globe including Poland, China and India where ADVA operates major R&D facilities. As a result, the group is challenged to retain and nurture its employees in order not to lose their knowledge, skills and relationships required to develop, sell and maintain the group's innovative products and solutions.

HARASSMENT OR DISCRIMINATION CLAIMS OR PROCEEDINGS (VERY LIKELY; MODERATE)

ADVA is committed to ensure equal employment opportunities without regard to race, religion, gender and any other protected factor and to prevent any related unwelcome behavior i.e. harassment. The group is proud about its international and diverse setup and employment base, and its open, transparent and respectful culture and management style. While multiple actions are taken to ensure ethical conduct of everyone working for the group globally, there is a high likelihood off alleged or actual violations, which may result in costly legal proceedings for the group depending on the allegations' nature, scope and location.

Minor and financial risks

Beyond the discussed 17 major risks, there is a broad range of minor risks that can also have a negative impact on ADVA. These uncertainties include financial risks such as the inability to secure financing, the risk of early maturity of loans due to the breach of material contractual obligations in connection with loan agreements and committed borrowing facilities totaling EUR 89.5 million, impairment of intangible assets and changes in interest rate levels, time risks related to carrier investment cycles and to distribution partnerships, legal risks pertaining to potential claims under product and warranty liabilities, supply shortages and/or currency risks through Brexit as well as general macro-economic risks and risks related to acquisitions. However, the management board of ADVA does not consider any of these or other uncertainties to be likely or to have a major impact on the group.

Changes to the overall risk situation and the classified major risks in 2018

During 2018, ADVA's major risks slightly changed mainly due to increasingly fast and intertwined innovation cycles blurring the line between product cost cutting by developing new innovative solutions and cost reductions in sourcing components, diverging supplier and manufacturer quality risks, an ongoing trade conflict between the U.S. and China and the increasing importance and (global) competition for talent. Specifically, 12 risks remained the same as in 2017, four risks were consolidated into two, and three new major risks were added. The overall risk situation nevertheless remained largely the same as the group's continued diversification and internationalization helped to balance all new or increased major risks.

Opportunity identification

The identification of opportunities is largely identical to the processes, tools and concepts as described in the "risk management system" section above. The annual definition of the group's opportunities is supported by the management board, which has regular discussions with key customers and industry thought leaders in order to identify new opportunities and technological trends. Throughout the group, agile processes maximize the group's ability to take advantage of newly identified trends. Current major opportunities are as follows:

MARKET SHARE GAIN IN DCI (LIKELY; VERY MATERIAL)

With more than 20 years of expertise in interconnecting data centers ADVA is a leading contender in the DCI space. In addition to broad success with private enterprise networks the company has gained a lot of traction with hyperscale ICPs. The revenue contribution from this customer group was less than 10% in 2018 – significantly lower than in previous years. In 2019 the new TeraFlexTM terminal of the FSP 3000 CloudConnectTM family is coming to market, providing 50% more capacity than the leading competitor's current product. TeraFlexTM has been successfully trialed by several customers in 2018 and will go into commercial ramp up in 2H2019. Due to the superior performance of the product there is a significant opportunity to win new footprint in important ICP accounts and to once again increase the group's market share.

ADDITIONAL DEMAND FOR VIRTUAL PACKET EDGE SOLUTIONS THROUGH ENTERPRISE IT PARTNERS (LIKELY; VERY MATERIAL)

More and more enterprises are embracing a so-called multi-cloud architecture, leveraging an optimum mix between private and public cloud solutions. With the advent of artificial intelligence in enterprise IT, cloud adoption is further accelerating and service providers are responding by redefining their strategies at the network edge. CSPs in particular are using NFV to add value to their connectivity services and convert enterprise IT spend into revenue for their managed services. Thanks to NFV, service providers can create and deliver new services quickly anywhere on the globe. ADVA has the world's most comprehensive portfolio of fiber-based Ethernet access solutions that empower industry-leading data connectivity services. In addition to the FSP 150 hardware, it is the company's Ensemble software architecture that provides further competitive differentiation. In 2017, ADVA successfully qualified its Ensemble Connector software for use in Verizon's "universal CPE" solution, earning its first software revenues. The solution has also been selected by Colt in 2018 and additional CSPs have been lined up. What's new is that also big IT service providers that specialize in turn-key solutions for the Fortune 500 enterprises have started to embrace NFV as a service delivery vehicle for their solutions. ADVA has forged close partnerships with some of the world's leading enterprise IT suppliers. The group sees potential for numerous new customer wins and a higher proportion of software sales in this area.

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INCREASING STRATEGIC IMPORTANCE OF SYNCHRONIZATION TECHNOLOGY (VERY LIKELY; MATERIAL)

The ongoing expansion of mobile networks towards LTE-Advanced (4.5G), as well as the preparations of mobile network operators for the fifth generation of mobile technology (5G), lead to more stringent requirements for time and frequency synchronization in carrier networks. ADVA's Oscilloquartz technology is industry-leading and continues to win competitive tenders. Oscilloquartz technology is gaining momentum with customers and is expected to make an increased contribution to consolidated revenue and margin. In addition to the increasing demands of mobile network operators for high-precision synchronization solutions, Oscilloquartz technology is also gaining traction in other applications. The synchronization of global databases of internet content providers, the synchronization of power grids with decentralized power generation as well as requirements from the fields of meteorology offer additional opportunities for this portfolio.

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Romy Opitz
Gareth Spence

"Cutting-edge technology and relationships built on trust. Both are equally important to who we are and what we do. To our customers, ADVA means world-leading innovation with a European heartbeat"

INFORMATION SECURITY AND REGIONALIZATION (VERY LIKELY; MATERIAL)

Large companies are concerned about the security of their data and business processes and are therefore building new data protection and storage solutions, which in turn require transmission technology to connect the geographically dispersed sites. In addition, the EU's GDPR, which came into effect in 2018, led to increased data protection requirements for all companies operating in Europe. In the meantime, the signs of national demarcation are multiplying on the political world stage. In many places, demands for regional solutions are becoming louder. This inevitably affects the technical realization of the cloud as well as the selection of the corresponding equipment suppliers. ADVA is the leading European specialist in optical transmission technology and the trusted partner of thousands of companies. ADVA's ConnectGuard™ security portfolio provides customers with comprehensive protection in different network scenarios and brings numerous competitive advantages. ADVA, a European company with strong visibility and presence in data center and network operators worldwide expects a positive market environment resulting in solid and profitable growth.

PORTFOLIO CROSS-SELLING (LIKELY; MATERIAL)

The acquisition of MRV Communications in 2017 further broadened ADVA's global customer base and provided inroads to networks that were previously not accessible. Since ADVA covers a much wider range of applications than MRV, the group can offer more solutions to the inherited customers. There have been several examples of successful cross-selling in 2018 and there is a high likelihood that additional network applications within the established customer base of MRV can be addressed and thus more revenue generated.

MARKET CONSOLIDATION (LIKELY; MATERIAL)

In 2018 one of the most aggressive competitors in the optical networking space got acquired by an US-American equipment manufacturer. The takeover further reduces the number of companies focusing on optical networking solutions. ADVA is the remaining European specialist for this technology and has established itself as a trusted partner. Through the acquisition of Overture in 2016 and the acquisition of MRV in 2017, the group has contributed to the consolidation and gained more strength and relevance. A consolidated competitive landscape leads to slower market price erosion and new opportunities for ADVA to enter new accounts as primary or secondary source.

Changes to the overall opportunity situation and the classified major opportunities in 2018

Compared to the previous year, the company beliefs that its opportunities have slightly increased in all aspects; number, likelihood as well as materiality. Not only the upcoming introduction of the new TeraFlex™ terminal but also the group's technology leadership in virtual packet edge solutions and synchronization technology are resulting in a significant potential for further revenues and profitable growth. Coupled with increasing demands for information security and regionalization, proven success in cross-selling and a consolidated competitive landscape, the group has all reason for looking ahead with optimism.

Overall opportunity and risk assessment

Based on careful inspection of the group's opportunity and risk profile at the time of the preparation of the combined management report, the management board of ADVA believes that the group's opportunities in the market for innovative connectivity solutions for cloud and mobile services clearly outweigh the risks identified. The management board has not identified any risks that pose a danger to ADVA's survival or endanger the future of the group. ADVA's overall balance between opportunity and risk is at about the same level as it was at the time of the publication of the 2017 combined management report.

Internal controls related to financial reporting

The management board of ADVA is responsible for establishing and maintaining an adequate system of internal controls. It has implemented an internal control system that enables the management board to ensure completeness, accuracy and reliability of financial reporting at group and legal entity level. When designing its internal control system, ADVA used the COSO framework as a key reference and source of guidance. The internal control over financial reporting is designed to provide reasonable assurance regarding the reliability of financial reporting. No system of internal control over financial reporting, including one determined to be effective, may prevent or detect all misstatements.

CONTROL ENVIRONMENT

The control environment is the foundation of the internal control system in every organization. ADVA fosters an environment of openness and integrity with a clear commitment to excellence, competence and the development of its employees. The group's leadership principles of integrity/honesty, decisiveness and respect are based on this philosophy, and the culture is reflected in the overall tone set by the management board. ADVA has a clear organizational structure with well-defined authorities and responsibilities. The bodies charged with the governance and control of the group (management board, supervisory board) actively participate in the running and steering of the business. The business is managed on a global basis and run via functional areas. Financial steering of the group and financial stewardship for individual legal entities is handled by the chief financial officer, under the audit committee's control.

RISK ASSESSMENT

As part of the internal controls related to financial reporting, the risk assessment follows the process described in the "risk management system" section.

CONTROL ACTIVITIES

At an individual entity level, ADVA's larger and more complex business units use an integrated enterprise resource planning solution, which also serves as general ledger system. Information technology controls have been implemented to restrict user access, ensure proper authorization of changes to the system and efficient handling of user help desk requests. Specific processes are defined and applied for the following reporting cycles in these business units: cash reporting, revenue recognition, accounts payable, capitalization of development expenses and recognition of subsidies for research, inventory reporting, fixed assets, payroll and provisions. ADVA carries out monthly analytical reviews and quarterly balance sheet reviews based on a four-eye principle between the local accounting and the consolidation functions.

For the consolidated financial statements, the balance sheet and income statement positions require a significant degree of judgment and estimation when being valued are determined and analyzed with the involvement of management. This is the case for impairment testing reviews (annual or when a triggering event occurs), capitalization of development projects (when the industrialization stage is reached) and tax reporting, specifically deferred taxes (quarterly). ADVA additionally carries out monthly intercompany reconciliations as part of the consolidation process and analytical reviews of actual vs. expected results based on a four-eye principle between the financial planning and the consolidation functions.

All business units follow a set of global accounting policies and reporting guidelines. The financial statements preparation process is monitored globally via a calendar that is communicated to all involved parties on a monthly basis. Checklists are completed both in the individual business units as well as at the consolidation level to ensure completeness of all closing steps. Periodic reviews by group management are conducted to detect errors and omissions.

INFORMATION AND COMMUNICATION TOOLS

The internal control system at ADVA is supported by tools to store and exchange information, enabling the management board to make informed business decisions about financial reports and disclosures. The following components ensure proper information and communication for financial reporting:

- Accounting systems for individual entities are matched to the degree of complexity of the business unit. For most entities, an integrated enterprise resource planning system, which also serves as general ledger system, is in place. All local accounts are mapped to the group chart of accounts, which is used group-wide.
- The group consolidation is supported by a database tool which is linked to the enterprise resource planning and financial planning systems via interfaces. The global financial planning system is used extensively in analyzing actual vs. expected results and thus monitoring the results of the consolidation.
- There are global accounting policies for the more complex financial statement positions of the group and a group chart of accounts for all other positions. Accounting policies are updated regularly and are implemented only after a thorough internal review and training.

INTERNAL MONITORING

As part of the ongoing monitoring, the chief financial officer is informed about all material misstatements and control breakdowns at group and business unit level on a quarterly basis in the executive summary to the financial statements. The reporting of deficiencies follows the principles of open and transparent communication. Follow-up is ensured through regular calls where corrective actions are presented.

Internal financial audit

ADVA maintains an internal audit function to regularly assess financial processes and systems.

Based on an annual risk assessment, the internal audit function develops an audit plan proposal for the upcoming year. The proposed plan is presented to, aligned with, and finally ratified by the audit committee. The internal audit function performs internal audit reviews throughout the year according to the audit plan. Audit results are discussed with responsible managers. In case of identified process or system weaknesses, the internal audit function makes recommendations and improvement actions are defined and agreed with the responsible manager(s). The progress of these and their success on removing the identified weaknesses is reviewed by the audit function. The state of internal auditing is reported quarterly to the audit committee and includes feedback about the progress of audits performed versus the audit plan, about the results of terminated audit reviews and about improvements resulting from actions taken.

ADVA's risk management system is part of the internal audit universe and as such subject to recurring internal audit reviews.

Outlook

The consolidation trend in the network equipment industry continued in 2018. The takeover of ADVA's competitor Coriant by the US network supplier Infinera further reduced the number of direct competitors in the field of optical networking technology. In addition, the trade tensions between China and the USA had a negative impact on the acceptance of the technology giant Huawei in the western world. Both events reduced price pressure in the market. Industry analysts estimate that numerous market segments in 2018 showed growth. According to these estimates* ADVA's addressable market has grown by approximately 2.5%.

* Industry analyst estimates for access, metro and long-haul WDM equipment ("optical") and access switching & routing ("packet edge") relevant to ADVA. Sources: Ovum, "optical networks forecast 2018-2023" published January 2019 and "service provider switching and routing forecast 2018-2023", published August 2018

Prayson Pate

"With our NFV technology, we're continuing to set new benchmarks for the rest of the industry to follow. For our customers, we offer freedom to innovate with new services delivered automatically and on demand."

In 2018, the ADVA group successfully solidified its position in the market and was able to grow revenues sequentially in all four quarters with positive profitability. The company's outlook for 2019 is positive.

The statements in this chapter apply to the ADVA group as well as to ADVA Optical Networking, SE. Further details on the projected market environment up to the year 2023, as well as the resulting opportunities, can be found in the "General economic and market conditions" section and in the "Business overview" section.

In order to ensure sustainable corporate success, ADVA focuses on the following long-term strategic objectives:

- Grow global revenues and profitability through extensive sales and marketing activities, focusing on large customers, new customer acquisition and the service and software business.
- Expand the group's proven innovation leadership and increase market share by meeting strategic customers' demand for innovative connectivity solutions.
- Maintain operational excellence by further focusing on industry-leading processes and best-in-class execution, ensuring product and service quality leadership, improved efficiency and increased overall customer satisfaction.
- Recruit, retain, motivate, educate and nurture the group's employees to sustainably achieve high levels of performance, personal growth and job satisfaction, while keeping employee turnover low.

Looking back at 2018, ADVA made good progress in most of these strategic elements:

2018 revenues were 2.4% below the 2017 level and thus slightly below the expectations of the management board communicated in the group management report 2017. There, the board had aimed for a slight increase in revenues in the lower single-digit percentage range for 2018. However, the strong ICP revenues from the first half of 2017 could not be fully compensated for in 2018. Thus, despite sequential growth in Q1 and Q2, the first half of 2018 remained below the revenue levels of 2017. It was not until Q3 that the company's revenue figures once again showed year-over-year growth.

Overall, however, ADVA's performance in many respects was positive in 2018. The integration of former competitor MRV, which was acquired in 2017, proceeded according to plan and was successfully completed in Q2. All relevant customers have been retained and successfully nurtured. The expected synergies were realized and there were first cross-selling successes. In addition, ADVA won new customers in all regions. Margins developed positively and the contributions from the company's technology investments in recent years were also positive. In particular the Oscilloquartz synchronization technology, which has been vigorously modernized and expanded since 2014, has contributed significantly, increasing sales with very good profitability and is expected to grow at an above-average rate in 2019.

The group's pro forma operating result in 2018 of EUR 23.3 million, or 4.6% of sales, was EUR 3.8 million higher than the EUR 19.5 million reported in 2017, or 3.8% of sales. As a result, the management board's expectation in the 2017 annual report that the pro forma operating result would reach a mid-single digit level as a percentage of revenues was reached. At EUR 15.0 million, or 3.0% of sales, operating profit in 2018 was significantly higher than the EUR 4.4 million, or 0.9% of sales, achieved in 2017. The increase is attributable to the efficient integration of MRV, consistent cost management and positive margin development.

In terms of innovation leadership, ADVA made good progress in all three major areas of technology in 2018. The final integration of the MRV portfolio and the associated expansion of the FSP 150 product family have further strengthened the company's competitiveness in cloud access solutions. In addition, new products featuring 100G technology were launched on the market. And, thanks to continued significant development efforts on network functions virtualization (NFV), additional customers have been acquired, who are expected to deliver significant revenues in 2019. Optical transmission technology continued to advance in the past fiscal year with new capabilities for the FSP 3000 CloudConnect™ platform, which was launched in 2016: The new TeraFlex™ terminal is the first product in a new generation of technology that operates at data rates of up to 600Gbit/s per wavelength. The new terminal has already been successfully tested by potential customers such as Tencent and will be commercially available in the first half of 2019. In the technology environment of Oscilloquartz, the company launched the OSA 5440, a new product that helps network operators deliver 5G-grade network synchronization.

Overall, the company's solution portfolio is more versatile and competitive than ever. All of the technologies in which the group invests are strategically significant and valuable for advancing global digitalization. ADVA is well-positioned to help customers build and grow their network, capitalizing on the megatrends cloud and mobility, as well as new technology such as edge computing, artificial intelligence, and the internet of things.

As far as operations are concerned, ADVA has further reinforced the excellent quality of its processes. Thanks to an innovative, globally standardized process landscape and an efficient IT infrastructure, US rival MRV, acquired in August 2107, was quickly integrated. time. The restructuring program launched in connection with the acquisition was successfully completed in the first half of 2018 and has generated the desired synergy effects. The bridge loan taken out in 2017 for the MRV acquisition was replaced in 2018 by a long-term syndicated loan.

Net liquidity stood at negative EUR 26.4 million at the end of 2018 and improved significantly year-on-year by EUR 11.7 million. However, the expectation of the management board communicated in the group management report 2017 to gradually return to positive net liquidity by the beginning of 2019 was not met. In addition to the somewhat weaker revenue development mentioned before, this is also due to the higher capital tied up in current assets.

As for customer satisfaction, ADVA uses the net promoter score metric to track progress. The company remained slightly below the value of 56% achieved in 2017. However, by achieving 52%, the high, positive level of at least 40% aspired to by the management board was once again clearly exceeded.

With attractive compensation programs and a rewarding work environment with comprehensive education opportunities, the group was able to largely maintain the high motivation of its employees and moderate turnover rates. However, following the restructuring program associated with the MRV acquisition, the company experienced an unusually high attrition rate especially in North America. Now that restructuring has been complete for more than two quarters, the increased turnover can be seen as a temporary phenomenon.

Following the small decline in revenues in the past financial year, the company aims to return to significant sales growth in the upper single-digit percentage range in 2019. In addition, the profitability of the group as measured by the pro forma operating result as a percentage of sales is expected to increase beyond the 2018 level. The reduced number of competitors due to industrial consolidation, the planned market launch of new products and the following factors, which are also described in the section "Risk report" under "Opportunities", will play a decisive role in this regard:

- The digitalization of society is progressing. More and more applications for daily life are migrating to the cloud. Thus, the strategic importance of a reliable, global and secure communication infrastructure is growing. The construction and expansion of fiber-based infrastructure is set to accelerate even further. Specialists in optical networking and transmission technology such as ADVA will benefit from this development.
- The virtualization of network functions is changing the business models of network operators, enabling them to provide innovative and customer-optimized services globally. In addition to the FSP 150 product family, it is ADVA's Ensemble software solution that provides additional market differentiation. NFV is driving convergence in the markets for access solutions and expanding ADVA's addressable market. The group sees potential for numerous new customer wins and a higher proportion of software sales in this area.

Combined management report
Outlook

- Security in information technology is becoming increasingly important and more stringent data protection requirements are impacting on the cloud. The company expects a trend towards regionalization in the technical implementation of data centers and in the selection of the corresponding suppliers. ADVA is the leading European specialist in transmission technology and a reliable partner for thousands of companies. Its ConnectGuard™ security portfolio provides customers with comprehensive protection in different network scenarios and brings numerous competitive advantages. ADVA, as a European company with strong visibility and presence with data center and network operators worldwide, is well positioned in this field.
- The strategic importance of synchronization technology continues to increase. The progressive expansion of mobile networks towards LTE-Advanced (4.5G), as well as the efforts of network operators to prepare for the fifth generation of mobile technology (5G), create stricter requirements regarding time and frequency synchronization in networks. ADVA's Oscilloquartz product portfolio is industry-leading, winning numerous sync bid tenders in 2018, and promises to outperform revenue growth and margins in 2019.
- With the acquisition of MRV in 2017, ADVA's customer base has grown worldwide, giving access to networks where the group was previously not present. With ADVA covering a much wider range of applications than MRV did previously, the group can now offer more solutions to those customers. As a result, there is a chance that additional network applications in the networks of this customer base can be addressed and thus more revenue generated. At the same time, the number of network suppliers in the market has continued to decline and Huawei, a globally powerful technology group, is experiencing headwinds and political pressure in many markets. As a result of this market consolidation, ADVA's position in the global environment has improved, and the company's profile as a European specialist and reliable partner for innovative network technology is now even sharper.

Despite macroeconomic turbulence, digitization is progressing worldwide. The global megatrends cloud and mobility, as well as the development and use of artificial intelligence and the internet of things, continue to drive demand for scalable, secure and environmentally sustainable communications infrastructure. Special investment pressure prevails at the so-called network edge. The edge of the network involves concepts such as edge computing, and it is here there that densification of infrastructure is necessary for the fifth generation mobile technology (5G). All three of ADVA's technology legs are strategically important in this environment, and the company's product portfolio has many differentiating features

In addition to the group's technological competence, it is also increasingly the personality profile of the company that generates positive market resonance. ADVA's brand promise to be a reliable partner for open network solutions, true to the company's slogan "connecting, extending and assuring the cloud" positions ADVA as an attractive network supplier in key growth markets. The combination of application-optimized innovation, short development and delivery times, a broad and growing customer base and a balanced distribution model differentiates ADVA from comparable companies and leads to a profitable, sustainable business model.

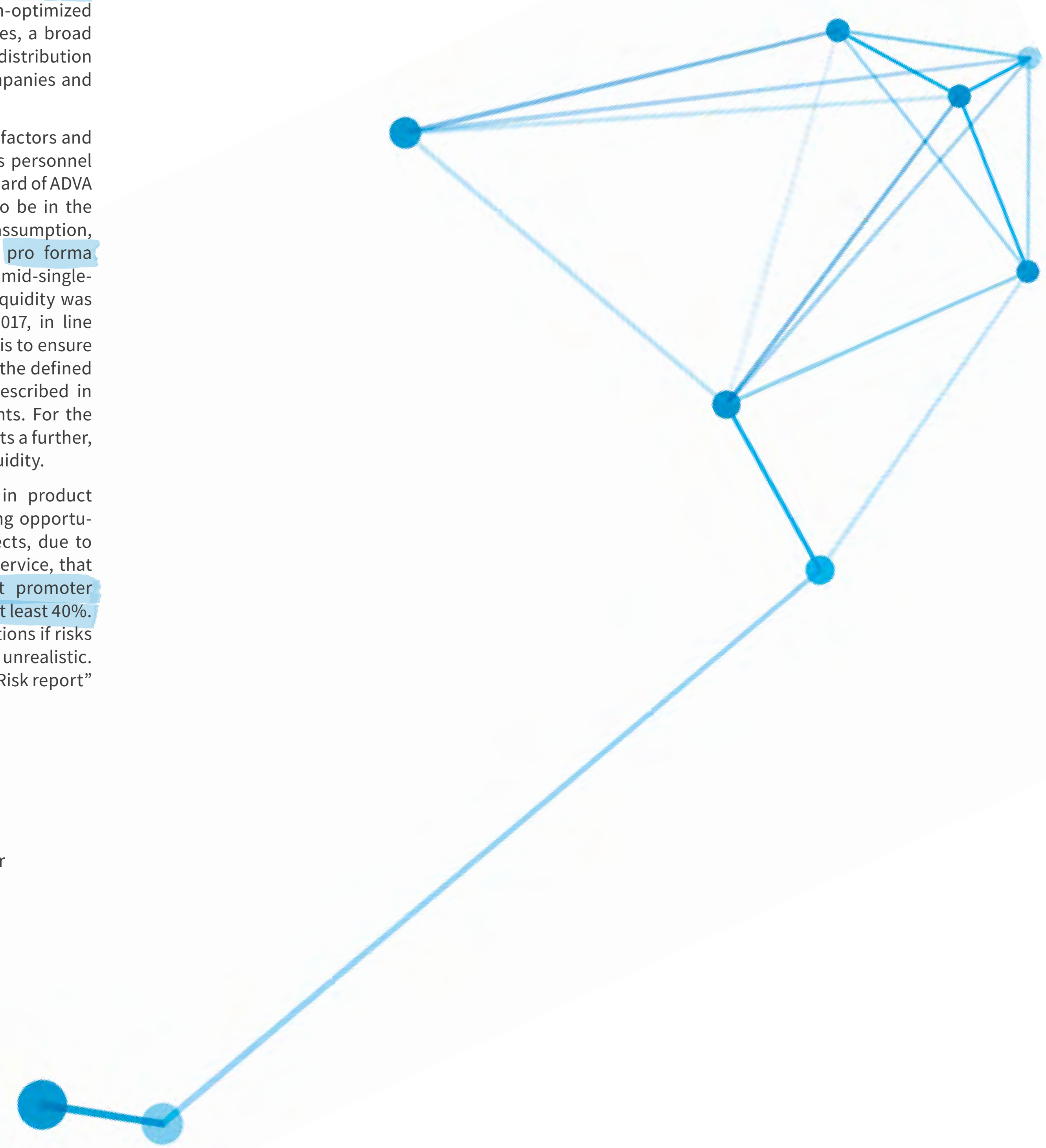
Against the background of the above-mentioned factors and taking into account planning parameters such as personnel and currency exchange rates, the management board of ADVA expects year-on-year revenue growth for 2019 to be in the upper single-digit percentage range. Under this assumption, the management board also expects that the pro forma operating result will exceed 2018 levels, still in the mid-single-digit percentage range of revenues. ADVA's net liquidity was reduced by the acquisition of MRV in August 2017, in line with the purchase price. The aim of the company is to ensure rapid debt relief and consistent compliance with the defined objectives of capital management, which are described in Note (34) to the consolidated financial statements. For the financial year 2019, the management board expects a further, significant improvement of the company's net liquidity.

The group will continue to selectively invest in product development, technology and revenue-generating opportunities. In addition, the management board expects, due to the continued focus on innovation, quality and service, that customer satisfaction measured by 2019's net promoter score will once again be at high positive levels of at least 40%. Actual results may differ materially from expectations if risks materialize or the underlying assumptions prove unrealistic. The major risks facing ADVA are discussed in the "Risk report" section.

Meiningen, February 19, 2019

Brian Protiva	Christoph Glingener
Ulrich Dopfer	Scott St. John

Combined management report
Outlook



IFRS CONSOLIDATED FINANCIAL STATEMENTS

Consolidated statement of financial position as of December 31, 2018

n thousands of EUR)	Note	Dec. 31, 2018	Dec. 31, 2017
Assets			
Current assets			
Cash and cash equivalents	(10)	62,652	58,376
Trade accounts receivable	(11)	97,936	81,327
Contract assets	(13)	320	n/a
Inventories	(12)	85,734	81,694
Tax assets	(26)	1,675	1,438
Other current assets	(14)	8,899	9,804
Total current assets		**257,216**	**232,639**
Non-current assets			
Property, plant and equipment	(15)	29,052	26,898
Goodwill	(15)	70,400	68,036
Capitalized development projects	(15)	87,926	85,175
Intangible assets acquired in business combinations	(15)	26,012	30,505
Other intangible assets	(15)	5,512	6,280
Deferred tax asset	(26)	7,315	10,614
Other non-current assets	(14)	3,105	3,741
Total non-current assets		**229,322**	**231,249**
Total assets		**486,538**	**463,888**

IFRS CONSOLIDATED FINANCIAL STATEMENTS
Consolidated statement of financial position as of December 31, 2018

(in thousands of EUR)	Note	Dec. 31, 2018	Dec. 31, 2017
Equity and liabilities			
Current liabilities			
Financial liabilities	(16)	19,400	79,061
Trade accounts payable	(17)	63,195	39,193
Advance payments received		-	93
Other provisions	(19)	15,005	21,994
Tax liabilities	(26)	5,067	6,446
Contract liabilities	(5), (20)	14,061	n/a
Refund liabilities	(5), (20)	511	n/a
Deferred revenues	(20)	n/a	15,062
Other current liabilities	(17)	28,337	27,136
Total current liabilities		**145,576**	**188,985**
Non-current liabilities			
Financial liabilities	(16)	70,084	17,500
Provisions for pensions and similar employee benefits	(18)	5,531	5,822
Other provisions	(19)	1,453	1,478
Deferred tax liabilities	(26)	10,828	12,502
Contract liabilities	(5), (20)	6,469	n/a
Deferred revenues	(29)	n/a	7,402
Other non-current liabilities	(17)	1,956	3,178
Total non-current liabilities		**96,321**	**47,882**
Total liabilities		**241,897**	**236,867**
Stockholders' equity entitled to the owners of the parent company	**(21)**		
Share capital		49,931	49,736
(Conditional capital EUR 4,778 thousand; prior year EUR 4,576 thousand)			
Capital reserve		316,072	314,019
Accumulated deficit		-131,371	-126,970
Net income/(loss)		9,678	-4,228
Accumulated other comprehensive income/(loss)		331	-5,536
Total stockholders' equity		**244,641**	**227,021**
Total equity and liabilities		**486,538**	**463,888**

Consolidated income statement for the period January 1 to December 31, 2018

(in thousands of EUR, except earnings per share and number of shares)	Note	2018	2017
Revenues	(22)	**501,981**	**514,471**
Cost of goods sold		-320,253	-348,251
Gross profit		**181,728**	**166,220**
Selling and marketing expenses*		-63,569	-62,889
General and administrative expenses		-35,024	-36,260
Research and development expenses		-76,588	-69,037
Other operating income	(23)	8,949	6,959
Other operating expenses	(23)	-507	-590
Operating income		**14,989**	**4,403**
Interest income	(24)	219	186
Interest expenses	(18), (24)	-1,627	-971
Other financial gains and losses, net	(25)	-1,096	-3,809
Income/(loss) before tax		**12,485**	**-191**
Income tax (expense) benefit, net	(26)	-2,807	-4,037
Net income/(loss) entitled to the owners of the parent company		**9,678**	**-4,228**
Earnings per share in EUR	(30)		
basic		0.19	-0.09
diluted		0.19	-0.09
Weighted average number of shares for calculation of earnings per share			
basic		49,810,321	49,607,289
diluted		50,234,216	50,177,479

* Selling and marketing expenses include EUR 356 thousand income from release changes of risk provision for trade accounts receivable according to IFRS 9. Further information on the risk provision are included in note (11).

Consolidated statement of comprehensive income

(in thousands of EUR)	Note	2018	2017
Net income/(loss) entitled to the owners of the parent company		**9,678**	**-4,228**
Items that possibly get reclassified to profit or loss in future periods			
Exchange differences on translation of foreign operations		7,860	-7,349
Items that will not get reclassified to profit or loss in future periods			
Revaluation of defined benefit plans	(18)	-1,993	-2,300
Total comprehensive income/(loss) entitled to the owners of the parent company	(21)	**15,545**	**-13,877**

Items in the statement above are disclosed net of tax. The income tax relating to each component of other comprehensive income is disclosed in note (26).

In 2018 and 2017, no items were reclassified (recycled) from comprehensive income to profit or loss.

Consolidated cash flow statement

(in thousands of EUR)	Note	2018	2017
Cash flow from operating activities			
Income/(loss) before tax		12,485	-191
Adjustments to reconcile income/(loss) before tax to net cash provided by operating activities			
Non-cash adjustments			
Amortization of non-current assets	(15)	49,367	46,864
Loss from disposal of property, plant and equipment and intangible assets	(15)	410	409
Stock compensation expenses	(38)	1,413	1,259
Other non-cash expenses		-37	589
Foreign currency exchange differences		1,280	-3,579
Changes in assets and liabilities			
Decrease (increase) in trade accounts receivable		-16,819	8,176
Decrease (increase) in inventories		-4,040	17,860
Decrease (increase) in other assets		1,334	2,375
Increase (decrease) in trade accounts payable		24,002	-38,905
Increase (decrease) in provisions		-6,163	-12,386
Increase (decrease) in other liabilities		-521	6,329
Income tax paid		-2,351	-1,666
Net cash provided by operating activities		**60,360**	**27,134**

(in thousands of EUR)	Note	2018	2017
Cash flow from investing activities			
Proceeds from government grants	(15)	-	90
Investments in property, plant and equipment	(15)	-14,029	-10,559
Investments in intangible assets	(15)	-34,239	-44,014
Net cash paid in the acquisition of affiliated companies	(8)	-	-36,213
Interest received		207	158
Net cash used in investing activities		**-48,061**	**-90,538**
Cash flow from financing activities			
Proceeds from capital increase and exercise of stock options	(21)	810	1,029
Payments received from financial liabilities	(16)	75,730	55,000
Cash repayment of financial liabilities	(16)	-82,813	-17,816
Interest paid		-1,953	-1,291
Net cash used in/(provided by) financing activities		**-8,226**	**36,922**
Net effect of foreign currency translation on cash and cash equivalents		203	-13
Net change in cash and cash equivalents		**4,276**	**-26,495**
Cash and cash equivalents on January 1		58,376	84,871
Cash and cash equivalents on December 31		**62,652**	**58,376**

Details on the preparation of the consolidated cash flow statement are included in note (29).

IFRS CONSOLIDATED FINANCIAL STATEMENTS
Consolidated statement of changes in stockholders' equity

Consolidated statement of changes in stockholders' equity

	Share capital					
(in thousands of EUR, except number of shares)	Number of shares	Par value	Capital reserve	Net income/(loss) and accumulated deficit	Accumulated other comprehensive income/(loss)	Total stockholders' equity entitled to the owners of the parent company
Balance on January 1, 2017	**49,498,934**	**49,499**	**312,305**	**-126,970**	**4,113**	**238,947**
Capital increase, including exercise of stock options	236,615	237	793			1,029
Stock options outstanding			921			921
Net loss				-4,228		-4,228
Exchange differences on translation of foreign operations					-7,349	-7,349
Remeasurement of defined benefit plans					-2,300	-2,300
Total comprehensive loss				-4,228	-9,649	-13,877
Balance on December 31, 2017	**49,735,549**	**49,736**	**314,019**	**-131,198**	**-5,536**	**227,021**
Transition effect from first-time adoption of IFRS 9				-173		-173
Balance on January 1, 2018	**49,735,549**	**49,736**	**314,019**	**-131,371**	**-5,536**	**226,848**
Capital increase, including exercise of stock options	195,406	195	615			810
Stock options outstanding			1,438			1,438
Net income				9,678		9,678
Exchange differences on translation of foreign operations					7,860	7,860
Remeasurement of defined benefit plans					-1,993	-1,993
Total comprehensive income				9,678	5,867	15,545
Balance on December 31, 2018	**49,930,955**	**49,931**	**316,072**	**-121,693**	**331**	**244,641**

Details on changes in stockholders' equity are presented in note (21).

Notes to the consolidated financial statements

General information

(1) Information about the company and the group

ADVA Optical Networking SE (hereinafter referred to as "the company" or "ADVA SE"), Märzenquelle 1-3, 98617 Meiningen, Germany is a Societas Europaea, registered as HRB 508155 at the commercial register in Jena. The management board authorized the consolidated financial statements for the year ended December 31, 2018 for issuance on February 19, 2018.

The ADVA Optical Networking group (hereinafter referred to as "ADVA Optical Networking", "the group" or "ADVA") develops, manufactures and sells optical and Ethernet-based networking solutions to telecommunications carriers and enterprises to deliver data, storage, voice and video services.

Telecommunications service providers, private companies, universities and government agencies worldwide use the group's systems. ADVA Optical Networking sells its product portfolio both directly and through an international network of distribution partners.

Significant accounting policies

(2) Basic principles for the preparation of the consolidated annual financial statements

The group's consolidated annual financial statements for the financial years ended December 31, 2018, and December 31, 2017, are prepared in accordance with the International Financial Reporting Standards (IFRS) published by the International Accounting Standards Board (IASB), as applicable in the European Union (EU) in consideration of interpretations of the Financial Reporting Interpretations Committee (IFRIC) and the applicable additional German statutory regulations according to § 315e Abs. 1 HGB. The consolidated financial statements have been prepared under the historical cost convention, as modified by the valuation of certain derivative financial instruments and share-based compensation transactions at fair value through profit and loss.

The financial year correlates with the calendar year. The consolidated annual financial statements are presented in EUR. Unless otherwise stated, all amounts quoted are in thousands of EUR. The balance sheet is separated into current and non-current assets and liabilities. The classification of income and expenses in the income statement is based on their function within the entity. When items on the balance sheet and in the income statement are summarized in the interest of clarity, this is explained in the notes to the consolidated financial statements.

The annual financial statements of the individual subsidiaries of the holding company ADVA Optical Networking SE, as subsumed in the consolidated annual financial statements, are all prepared using the same accounting and valuation policies and the same balance sheet date.

(3) Effects of new standards and interpretations

The accounting policies followed are consistent with these of the prior financial year, except for the adoption of new and amended IFRSs and interpretations (IFRICs) during the year.

STANDARDS, AMENDMENTS AND INTERPRETATIONS APPLICABLE FOR THE FIRST TIME IN 2018

In 2018, following standards and interpretations have been adopted for the first time:

Standard	Topic	First-time adoption*	Expected impact on the financial position and performance
IFRS 9 (2014)	Financial Instruments	Jan. 1, 2018	See note (4)
Amendments to IFRS 9	Prepayment features with negative compensation	Jan. 1, 2018	none
IFRS 15 including relevant clarifications	Revenue from Contracts with Customers	Jan. 1, 2018	See note (5)
Amendments to IFRS 2	Share-based Payment	Jan. 1, 2018	none
Amendments to IFRS 4	Insurance Contracts regarding implementation of IFRS 9	Jan. 1, 2018	none
Annual improvements 2016	The improvements include changes to: IAS 28 – Investments in Associates and Joint Ventures IFRS 12 – Disclosure of Interests in Other Entities as well as editorial amendments to IFRS 1	Jan. 1, 2018	none
IFRIC 22	Foreign Currency Transactions and Advance Considerations	Jan. 1, 2018	none
Amendments to IAS 40	Investment Property	Jan. 1, 2018	none

* To be applied in the first reporting period of a financial year beginning on or after this date.

NEW ACCOUNTING REQUIREMENTS NOT YET APPLICABLE FOR FIRST-TIME ADOPTION

The IASB and the IFRIC have issued further Standards and Interpretations in 2018 and previous years that are not applicable for the financial year 2018. In addition, the first-time adoption is partly still subject to endorsement by the EU.

Standard	Topic	First-time adoption*	Expected impact on the financial position and performance
IFRS 16	Leases	Jan. 1, 2019	see below
IFRS 17	Insurance contracts	Jan. 1, 2021	none
Amendments to IAS 19	Plan amendment, curtailment or settlement	Jan. 1, 2019	none
Amendments to IAS 28	Long term interest in associates and joint ventures	Jan. 1, 2019	none
Annual improvements 2017	The improvements include changes to: IFRS 3/IFRS 11 – Business combinations/joint ventures IAS 12 – Income taxes IAS 23 – Borrowing costs	Jan. 1, 2019	under review
IFRS Framework	Revision of the IFRS Framework	Jan. 1, 2020	under review
Amendments to IFRS 3	Definition of a business	Jan. 1, 2020	under review
Amendments to IAS 1 and IAS 8	Definition of materiality	Jan. 1, 2020	under review
IFRIC 23	Uncertainty over income tax	Jan. 1, 2019	none

* To be applied in the first reporting period of a financial year beginning on or after this date.

On January 13, 2016, the IASB published IFRS 16 Leases regarding accounting of lease contracts. The new standard will replace IAS 17 and all related interpretations and implements a consistent lease accounting model. Hence, lessees will recognize assets (right to use) and lease liabilities for all lease contracts with terms over 12 months except for those contracts considered of low value. The analysis showed that the group has facility and office rents as well as lease contracts for company cars that will have to be recognized as lease assets. At present, ADVA Optical Networking will adopt the standard for financial years starting January 1, 2019 and will apply the modified retrospective approach.

The first-time application will have the following effects on the balance sheet, income statement and cash flow statement of the group:

- The accounting for the value in use of the leases results in the recognition of a new position for rights of use in fixed assets amounting to EUR 36,202 thousand on January 1, 2019.
- In current and non-current liabilities, obligations under leases are recognized under other liabilities. The amount as at January 1, 2019, amounts to EUR 5,150 thousand and EUR 32,063 thousand in current or non-current other liabilities, respectively.
- From 2019, depreciation charges on the capitalized rights to use as well as expenses in connection with short-term, low-volume leases in the operating result will be included in the income statement. The interest component of the repayment of liabilities from leasing contracts will be recognized in the financial result. This leads to an improvement in the operating result of EUR 205 thousand.
- In the cash flow statement, payments for short-term and/or minor low-value lease agreements continue to be included in the operating cash flow. All other payments relating to lease agreements are allocated to the cash flow from financing activities.

Besides the described standards, the adoption of new or revised standards and interpretations – from today's perspective – will not have a material impact on the financial position and performance of the group. The group does not consider early adoption of new standards.

(4) Changes due to first-time adoption of IFRS 9

The final version of IFRS 9 (2014) replaces IAS 39 Financial instruments: Recognition and measurement and all other previous regulations. ADVA Optical Networking adopted the standard for the first-time for financial years starting on or after January 1, 2018. In line with the general ADVA Optical Networking practice, the group did not consider early adoption of the standard. The modified retrospective method of transition was applied during the first-time adoption. Accumulated effects have been reported in the opening balance sheet as of January 1, 2018, without effect to net income. Prior period numbers have not been adjusted.

From 2018, the first-time application of IFRS 9 results in changes in the classification and valuation of other investments and trade accounts receivable. The changes to classification and valuation methods for financial instruments are further described in note (32).

ADVA Optical Networking reports the following effects of the first-time adoption:

Investments currently classified as available for sale financial asset will be accounted for as financial asset at fair value through profit and loss in future reporting periods as they are equity instruments according to the definition in IAS 32: The option to classify as financial instruments at fair value through other comprehensive income (so-called FVOCI-option) has not been applied. The values reported according to IAS 39 regulations for available for sales instruments represent the fair value according to IFRS 9.

From 2018, trade accounts receivable that are subject to an agreement for sale of accounts receivable will also be recognized at fair value through profit and loss. They will be presented separately from other trade receivables, that are classified at amortized cost. Due to the short-term nature of these receivables the carrying amount corresponds with the fair value at the reporting date.

Regarding financial liabilities no changes applied due to the first-time adoption of IFRS 9. In particular, classification of financial liabilities according to IFRS 9 did not significantly change compare to prior regulations. Thus, no transition effects are reported regarding financial liabilities.

IFRS CONSOLIDATED FINANCIAL STATEMENTS
Notes to the consolidated financial statements

The following table highlights changes related to valuation categories of financial assets due to the first-time adoption of IFRS 9:

	Valuation category		Carrying amount		
(in thousands of EUR)	IAS 39	IFRS 9	IAS 39	IFRS 9	difference
Cash and cash equivalents	LaR*	AC*	58,376	58,376	-
Trade accounts receivable	LaR*	AC*	79,828	79,655	-173
		FVTPL*	1,499	1,499	-
Other current and non-current financial assets	LaR*	AC*	6,121	6,121	-
Derivatives without hedging relationships	FVTPL*	FVTPL*	12	12	-
Investments	AfS*	FVTPL*	1,374	1,374	-
Total active financial instruments on Jan. 1, 2018			**147,210**	**147,037**	**-173**

* LaR: loans and receivables; AC: at amortized cost; FVTPL: at fair value through profit or loss; AfS: available for sale

The carrying amounts of financial assets have been adjusted as follows:

(in thousands of EUR)	AC (LaR 2017)*)	AfS at cost (only 2017)*)	FVTPL*)	Total financial assets
Amount on Dec. 31, 2017 according to IAS 39	145,824	1,374	12	147,210
Revaluation according to IFRS 9	-173	-	-	-173
Reclassification from von LaR to FVTPL	-1,499	-	1,499	-
Reclassification from AfS at cost to FVTPL	-	-1,374	1,374	-
Amount on Jan. 1, 2018 according to IFRS 9	**144,152**	**-**	**2,885**	**147,037**

* LaR: loans and receivables; AC: at amortized cost; FVTPL: at fair value through profit or loss; AfS: available for sale

The new impairment model changes the calculation of impairment from an incurred loss model to an expected credit loss model. ADVA Optical Networking calculates the impairment on trade receivables that are accounted for at amortized cost according to IFRS 9 based on the simplified approach on the basis of a provision matrix.

Due to the first-time adoption of IFRS 9 impairment of trade accounts receivable as of January 1, 2018 have been increased by EUR 173 thousand. The transition effect has been reported in retained earnings.

(in thousands of EUR)	
Impairment	
As of Dec. 31, 2017 according to IAS 39	788
IFRS 9 transition effect	173
As of Jan. 1, 2018, according to IFRS 9	**961**

As of January 1, 2018, due to materiality no impairment according to IFRS 9 has been considered in respect of other financial assets and contract assets according to IFRS 15. Impairment charges at the current reporting date are explained in the notes to the respective assets if applicable.

(5) Changes due to the first-time adoption of IFRS 15

IFRS 15 requires separate presentation of contract assets and contract liabilities in the balance sheet. As of January 1, 2018, this resulted in reclassifications of receivables, in relation to service contracts and contract liabilities in relation to expected volume discounts, rights to return and a customer loyalty program which have formerly been included in other balance sheet line items. Following items were identified and illustrate reclassifications as of January 1, 2018:

1. Liabilities amounting to EUR 680 thousand in relation to expected volume discounts and refunds to customers previously presented as current provisions were reclassified to refund liabilities.
2. Liabilities of EUR 142 thousand in relation to outstanding credit notes previously presented as reduction from trade receivables will be presented as contract liabilities.
3. Liabilities of EUR 142 thousand in relation to the customer loyalty program previously presented as reduction from trade receivables will be presented as contract liabilities..
4. Liabilities amounting to EUR 22,464 thousand in relation to prepaid service contracts previously recognized as deferred revenue will be reclassified to contract liabilities.

(6) Recognition and measurement

INVENTORIES

Inventories are valued at the lower of cost or net realizable value. The cost of purchase is determined by the average method. Production costs include direct unit costs, an appropriate portion of necessary manufacturing overheads and production-related depreciation that can be directly assigned to the production process. Administrative and social insurance charges that can be assigned to production are also taken into account. Financing charges are not classified as part of the at-cost base. The net realizable value is the estimated selling price that could be realized on the closing date in the context of ordinary business activity, less estimated costs of completion and costs necessary to make the sale.

Inventory depreciation covers risks relating to slow-moving items or technical obsolescence. Where the reasons for previous write-downs no longer apply, these write-downs are reversed.

PROPERTY, PLANT AND EQUIPMENT

Property, plant and equipment is stated at historic cost less accumulated depreciation and accumulated impairment losses, if any. The present value of the expected cost for the decommissioning of the asset after its use is included in the cost of the respective asset if the recognition criteria for a provision are met.

Subsequent costs are included in the asset's carrying amount or recognized as separate asset only when it is probable that future economic benefits associated with this item will flow to the group and the cost can be measured reliably. All other repairs and maintenance costs are charged to the income statement during the financial period in which they are incurred.

Depreciation on property, plant and equipment is calculated on a straight-line basis over the estimated useful economic lives of the assets as follows:

• Buildings	20 bis 25 years
• Technical equipment and machinery	3 bis 4 years
• Factory and office equipment	3 bis 10 years

No regular depreciation applies for land and similar rights.

Leasehold improvements and other subsidies received under new or renewed operating lease contracts are accounted for according to SIC 15 (Operating leases – incentives). The benefit is recognized as a reduction of the rental expense over the contractual lease term. Leasehold improvements are capitalized as tangible assets and depreciated over the term of the lease on a straight-line basis.

An item of property, plant and equipment is derecognized upon disposal or when no future economic benefits are expected from its use or disposal. Any gain or loss arising on derecognition of the asset (calculated as the difference between the net disposal proceeds and the carrying amount of the asset) is included in the income statement when the asset is derecognized.

The assets' residual values, useful economic lives and methods of depreciation are reviewed at each financial year-end and adjusted prospectively, if appropriate.

INTANGIBLE ASSETS

Intangible assets acquired separately are measured on initial recognition at cost. The cost of intangible assets acquired in a business combination is their fair value on the date of acquisition. Following initial recognition, intangible assets are carried at cost less any accumulated amortization and any accumulated impairment losses. Internally generated intangible assets, excluding capitalized development costs, are not capitalized, and expenditure is reflected in profit or loss in the year in which the expenditure is incurred.

The useful economic lives of intangible assets are assessed to be either finite or indefinite.

Intangible assets with finite lives are amortized on a straight-line basis over the expected useful economic lives of the assets as follows:

• Capitalized development projects	3 bis 5 years
• Intangible assets acquired in business combinations	4 bis 9 years
• Software and other intangible assets	3 bis 6 years

Intangible assets with finite useful economic lives are assessed for impairment whenever there is an indication that the intangible asset may be impaired. The amortization period and the amortization method for an intangible asset with a finite useful life is reviewed at each financial year-end. The amortization expense on intangible assets with finite lives is recognized in profit or loss in the expense category consistent with the function of the intangible asset.

Intangible assets with an indefinite useful life are not amortized. An impairment loss is recognized for the amount by which the asset's carrying amount exceeds its recoverable amount. The recoverable amount is the higher of an asset's fair value less costs of disposal and value in use. The useful life of an intangible asset with an indefinite life is reviewed at least annually to determine whether the indefinite life assessment continues to be applicable. If not, the change in the useful life assessment from indefinite to finite is made on a prospective basis. There are no intangible assets with indefinite lives other than goodwill and development projects in progress.

Gains or losses arising from derecognition of an intangible asset are measured as the difference between the fair value less costs to sell and the carrying amount of the asset, and they are recognized in the income statement when the asset is derecognized.

Goodwill
An unlimited useful life is assumed for goodwill acquired in the context of business combinations. Impairment reviews are performed at the cash generating unit level on the balance sheet date or when there is an indication that the goodwill may be impaired in accordance with IAS 36. Impairment losses on goodwill recognized in prior periods are not reversed. See note (15).

Intangible assets acquired in business combinations
Intangible assets acquired in business combinations have a finite useful life. They are recognized at cost and amortized on a straight-line basis over estimated useful economic lives of five to nine years. They are tested for impairment if an indication exists that the recoverable amount of the asset may have decreased.

The breakdown of intangible assets into individual items is included in note (15).

Capitalized development projects
Development expenses for new products are capitalized as development projects if

- they can be unambiguously assigned to these products,
- the products under development are technically feasible and can be marketed,
- there is reasonable certainty that the development activity will result in future cash inflows,
- ADVA Optical Networking intends and is able to complete and use the development project and
- there is the availability of adequate technical, financial and other resources to complete the development and to use or sell the intangible asset.

Capitalized development projects include all costs that can be directly assigned to the development process. Financing charges are capitalized if the development project represents a qualifying asset in the sense of IAS 23.

After initial recognition of a development project as an asset, measurement is at historical cost, less accumulated amortization and impairment. The straight-line method of amortization is used from the start of production through the estimated selling periods for the products developed (generally between three and five years). Completed as well as ongoing development projects are tested for impairment on the balance sheet date or when there is an indication of potential impairment. Impairment losses are recognized if appropriate.

Research costs are expensed as incurred according to IAS 38.

Impairment of non-financial assets
Intangible assets with indefinite useful economic lives are tested for impairment annually and whenever there is an indication for potential impairment, either individually or at the cash generating unit level.

Intangible assets with finite useful economic lives are tested for impairment if an indication exists that the assets may have been impaired. An impairment loss is recognized for the amount by which the asset's carrying amount exceeds its recoverable amount. The recoverable amount is the higher of an asset's fair value less costs of disposal and value in use. Prior impairments of non-financial assets (other than goodwill) are reviewed for possible reversal at each reporting date.

GOVERNMENT GRANTS

ADVA recognizes government grants for fixed assets as well as for grants related to research projects.

Government grants are recognized where there is reasonable assurance that the grant will be received, and all attached conditions will be met. When the grant relates to an expense item, it is recognized as income over the period necessary to match the grant on a systematic basis to the costs that it is intended to compensate. Where the grant relates to fixed assets, it is recognized as a reduction of purchase costs and released as a reduction of depreciation expense over the expected useful life of the related asset.

BORROWING COSTS

Borrowing costs directly attributable to the acquisition, construction or production of an asset that necessarily takes a substantial period to get ready for its intended use or sale (qualifying asset) are capitalized as part of the cost of the respective assets. If borrowing costs cannot be directly attributed to the acquisition, construction or production of an asset, an assessment is made on whether general borrowing costs should be recognized that would have been avoided if the asset was not acquired, constructed or produced. All other borrowing costs are expensed in the period they occur. Borrowing costs consist of interest and other costs that an entity incurs in connection with the borrowing of funds.

LEASING

Leasing contracts are classified as finance leases if substantially all risks and rewards, and with it the economic ownership, are transferred to the lessee. All other leasing transactions are classified as operating leases.

Property, plant and equipment acquired by ADVA Optical Networking through finance lease contracts is stated at the fair value of the leased property or, if lower, the present value of the future minimum lease payments when the contract commences. Finance lease contracts are then amortized using the straight-line method over the shorter of the leasing period or the estimated useful life of the assets. The correspondent liability is shown as finance lease obligation. The lease payment to the lessor is apportioned between finance charge and the reduction of the outstanding liability. The finance charge is allocated to each period during the lease term to produce a constant periodic rate of interest on the remaining liability.

Operating lease payments are recognized as an expense in the income statement on a straight-line basis over the lease term.

POST-EMPLOYMENT BENEFITS

ADVA Optical Networking maintains defined benefit plans in three countries based on the pensionable compensation of its employees and their length of service. Some of these pension plans are financed through external pension funds. Provisions for pensions are actuarially measured using the projected unit credit method for defined benefit pension plans, taking into account not only the pension obligations and vested pension rights known at the reporting date, but also expected future salary and benefit increases. The interest rate used to determine the present value of the obligations is generally set based on the yields on high-quality corporate bonds or government bonds in the respective currency area. The return on existing plan assets and expenses for interest added to obligations are reported in finance costs. Service cost is classified as operating expenses. Past service cost not recognized due to a change in the pension plan shall immediately be recognized in the period in which the change took effect. Gains and losses arising from adjustments and changes in actuarial assumptions are recognized immediately and in full in the period in which they occur within other comprehensive income. Further details on recognition and measurement of employee benefits is included in note (18).

In addition, ADVA Optical Networking grants defined contribution plans to employees of some group entities in accordance with statutory or contractual requirements. The payments are made to state or private pension insurance funds. Under defined contribution plans, the employer does not assume any other obligations beyond the payment of contributions to an external fund. The amount of the future pension payments will exclusively depend on the contribution made by the employer (and their employees, if applicable) to the external fund, including income from the investment of such contributions. The amounts payable are expensed when the obligation to pay the amounts is established and classified as operating expenses.

SHARE-BASED COMPENSATION TRANSACTIONS

Employees (including senior executives) of ADVA Optical Networking receive remuneration in the form of share-based compensation transactions, whereby employees render services as consideration for equity instruments (equity-settled transactions) or they are granted stock appreciation rights, which are settled in cash (cash-settled transactions). Share-based compensation transactions are reported and valued in accordance with IFRS 2.

Share-based compensation transactions between different entities of ADVA Optical Networking are considered as either equity-settled or cash-settled share-based compensation transactions in the individual financial statements of ADVA Optical Networking SE. The group entities employing the beneficiaries measure the received services as an equity-settled share-based compensation transaction. No repayment arrangements have been set up between the entities of the group.

Equity-settled transactions

The cost of equity-settled transactions with employees is measured by reference to the fair value on the grant date. The fair value is determined by an external expert using an appropriate pricing model. See note (38) for further details.

The cost of equity-settled transactions is recognized, together with the corresponding increase in equity, straight-line over the period in which the relevant employees become fully entitled to the award (vesting date). Vesting date ends with the first exercise possibility. From that day, the employee is entitled to benefit. No expense is recognized for awards that do not ultimately vest, except for awards where vesting is conditional upon market condition, which are treated as vesting irrespective of whether or not market condition is satisfied, if all other performance conditions are satisfied.

Where the terms of an equity-settled transaction award are modified, the minimum expense recognized is the expense as if the terms had not been modified, if the original terms of the award are met. An additional expense is recognized for any modification that increases the total fair value of the share-based compensation transaction or is otherwise beneficial to the employee as measured on the date of modification.

Where an equity-settled award is cancelled, it is treated as if it vested on the date of cancellation, and any expense not yet recognized for the award is recognized immediately. This includes any award where non-vesting conditions within the control of either the entity or the employee are not met. However, if a new award is substituted for the cancelled award and designated as a replacement award on the date that it is granted, the cancelled and new awards are treated as if they were a modification of the original award, as described in the previous paragraph. All cancellations of equity-settled transactions are treated equally.

The dilutive effect of outstanding options is reflected in the computation of earnings per share. See note (30).

Cash-Settled Transactions

The cost of cash-settled transactions is measured initially at fair value on the grant date. The fair value is expensed straight-line over the vesting period with recognition of a corresponding provision. The provision is re-measured on each balance sheet date up to and including the settlement date, with changes in the fair value recognized in profit or loss.

PROVISIONS

Provisions are recognized when the group has a present obligation (legal or constructive) as a result of a past event, when it is probable that an outflow of resources embodying economic benefits will be required to settle the obligation and a reliable estimate can be made of the amount of the obligation. The amount recognized as a provision represents the best estimate of the expenditure required to settle the present obligation.

Where the group expects some or all of a provision to be reimbursed, for example under an insurance contract, the reimbursement is recognized as a separate asset but only when the reimbursement is virtually certain. The expense relating to any provision is presented in profit or loss, net of any reimbursement. If the effect of the time value of money is material, provisions are discounted using a current pre-tax rate that reflects, where appropriate, the risks specific to the liability. Where discounting is used, the increase in the provision over time is recognized in other financial gains and losses, net.

COMMON STOCK

Common stock is disclosed in stockholder's equity.

Incremental costs directly attributable to the issuance of new ordinary shares or options are shown in equity as a deduction, net of tax, from the proceeds.

Where any group company purchases the company's equity share capital (treasury shares), the consideration paid, including any directly attributable incremental costs, is deducted from equity until the shares are cancelled or reissued. Where such shares are subsequently reissued, any consideration received, net of any directly attributable incremental transaction costs, is included in equity.

FINANCIAL INSTRUMENTS

Financial instruments are contracts that give rise to a financial asset in one entity and a financial liability or equity instrument in another entity. ADVA Optical Networking recognizes financial assets and financial liabilities in the balance sheet when a company in the group becomes a contractual party to the financial instrument.

Financial assets and financial liabilities are generally reported at gross value. Netting only applies if the offsetting of the amounts is legally enforceable and it is intended to actually offset them. In general, ADVA does not intend to offset any amounts.

All customary purchases and sales of financial assets are recognized on the trading date, i.e. the date on which ADVA Optical Networking enters into the obligation to purchase the asset.

Financial assets

ADVA Optical Networking's financial assets include, in addition to trade receivables, cash and cash equivalents, other receivables, other investments and derivative financial instruments.

Classification

Financial assets are initially allocated to one of the following measurement categories in accordance with IFRS 9:

1. measured at amortized cost
2. measured at fair value through profit or loss
3. measured at fair value through other comprehensive income (debt instruments)
4. measured at fair value through other comprehensive income (equity instruments)

Financial assets that are debt instruments according to IAS 32 are classified based on the business model for managing the financial assets and the contractual agreed cash flows. Debt instruments are classified as amortized cost if the business model "hold to collect" applies and contractual cash flows solely consist of principal and interest on the outstanding redemption. If the business model is based on the collection of contractual cash flows as well as on the sale of the instruments, the financial assets are classified at fair value through other comprehensive income (FVOCI). Financial assets held for sale and derivative financial instruments that are not designated as hedges are classified as at fair value through profit or loss (FVTPL).

Debt instruments are reclassified if the business model for managing those assets changes.

Financial assets with embedded derivatives are considered in their entirety when determining whether their cash flows represent only principal and interest payments.

In general, equity instruments are classified as instruments to be measured at fair value through profit or loss (FVTPL). For equity instruments not available for trading purposes, an irrevocable option applies to recognize changes in through other comprehensive income.

ADVA Optical Networking classifies receivables that are not subject to factoring, cash and cash equivalents, and rent deposits as financial assets, which are carried at amortized cost. Trade receivables for which a factoring agreement is in place are classified as financial assets at fair value through profit or loss.

The group has not made use of the option to classify financial assets at fair value through profit or loss upon initial recognition.

Initial measurement

At initial recognition, the group measures a financial asset at its fair value plus, in the case of a financial asset at fair value through other comprehensive income, transactions costs that are directly attributable to the acquisition of the financial asset. Transaction costs of financial assets carried at fair value through profit or loss are expensed immediately.

Financial assets with embedded derivatives are considered at their entirety when determining whether their cash flows are solely repayment of the principal and interest.

Subsequent measurement

The subsequent measurement of ADVA Optical Networking's financial assets is based on their classification:

1. at amortized cost: Interest income from these financial assets is reported in the financial income using the effective interest method. Gains and losses on derecognition are recorded in the income statement and, considering related foreign currency gains and losses, reported under other operating income and expenses,
2. at fair value through profit or loss: Gains or losses on debt instruments, which are subsequently measured at fair value through profit or loss, are netted in the income statement as other operating income or expenses in the period in which they arise.

The group subsequently measures all equity instruments at fair value. Changes in fair value are recognized in other gains/ (losses) in the income statement as applicable.

For investments in equity instruments that are not held for trading, an irrevocable option to account for the equity investments at fair value through comprehensive income (FVOCI) at the time of initial recognition is available. ADVA Optical Networking has not made use of this option.

Impairment

The group assesses expected future credit losses associated with its debt instruments measured at amortized cost based on future expectations. A respective risk provision or, in case of an actual loss that already occurred, an impairment loss is recognized.

General approach

Generally, financial assets are considered as having a low default risk at initial recognition resulting in a 12-month expected credit loss provision. In case of a significant increase in credit risk, the lifetime expected credit losses are recognized. Amongst others debtor's payment delays of more than 30 days are considered an indicator for increase in default risk.

ADVA Optical Networking assesses expected credit losses using the general approach for cash and cash equivalents and other financial assets, except for trade receivables.

Simplified approach

For trade receivables and contract assets with no significant financing component the group applies the simplified approach, which requires lifetime expected credit losses to be recognized from initial recognition of the receivables.

In order to measure expected credit losses, trade receivables are summarized on the basis of common credit risk characteristics and overdue days. The expected credit losses are based on customers' historical payment behavior for a period of three years as well as on historical defaults. These are reviewed once a year and adjusted to take current and future information on macroeconomic elements (e.g. geopolitical events, currency fluctuations, inflation, trade wars, state subsidies) into account, that have an influence on customers' ability to meet their financial obligations.

Contract assets relate to work in progress that has not been invoiced and bears essentially the same risk characteristics as trade receivables. The group has therefore concluded that the expected loss rates for trade receivables are a reasonable approximation of the loss ratios for contract assets.

Financial assets are considered to be impacted by credit worthiness and are written off if there is objective evidence of impairment. An indication of impairment is, inter alia, if debtor payments are delayed more than two years. If, based on reasonable estimates, it is not expected to receive the respective payment, financial assets are derecognized. One indicator for this is the failure of the debtor to commit to a repayment plan.

Derecognition

ADVA Optical Networking derecognizes financial assets (or parts of their financial assets where applicable) when the rights to receive cash flows from the financial asset have expired or have been transferred and the group substantially transferred all opportunities and risks associated with the ownership. In the case of sales of trade receivables, essentially all opportunities and risks are transferred to the buyer of the receivables.

Financial liabilities

The financial liabilities of ADVA Optical Networking include trade payables and other liabilities, bank overdrafts, loans and derivative financial instruments.

Classification

Financial liabilities are initially assigned to one of the following valuation categories in accordance with IFRS 9:

1. measured at amortized cost
2. measured at fair value through profit or loss.

The group has not used the option to designate financial liabilities as "at fair value through profit or loss" on initial recognition of financial assets.

Subsequent measurement

The measurement of financial liabilities of ADVA Optical Networking depends on their classification as follows:

1. Financial liabilities at fair value through profit or loss: This category includes derivative financial instruments that are not designated as hedging instruments in accordance with IFRS 9 hedge accounting rules. Gains and losses are recognized in the income statement.
2. Financial liabilities measured at amortized cost: This category includes trade payables and interest-bearing loans. After initial recognition, these are measured at amortized cost using the effective interest method. Gains and losses are recognized in profit or loss when the liabilities are derecognized as well as in case of amortization using the effective interest method. Amortization according to the effective interest method is included in interest expenses in the profit and loss account.

Derecognition

A financial liability is derecognized when the obligation under the liability is settled, cancelled or expired. When an existing financial liability is replaced by another from the same lender on substantially different terms, or the terms of an existing liability are substantially modified, this exchange or modification is treated as a derecognition of the original liability and the recognition of a new liability. In case of minor changes in conditions a change in the present value will be considered in profit or loss.

Derivative financial instruments and hedging activities
The group entered into forward rate agreements to hedge foreign currency exposure of expected future cash flows in foreign currency.

Derivatives are initially recognized at fair value on the date a derivative contract is entered into and are subsequently re-measured to their fair value at the end of each reporting period. The accounting for subsequent changes in the fair value depend on whether the derivative is designated as a hedging instrument.

The group did not apply hedge accounting rules according to IFRS 9 during the years ended December 31, 2018 and 2017. Thus, changes in fair value of the derivatives are recognized in profit or loss immediately.

CONTRACTS WITH CUSTOMERS

Revenue recognition
Revenue is recognized when a performance obligation is satisfied, i.e. when control of the goods or services is transferred to the customer. Control is passed either at a point in time or over time.

When hardware is sold control is transferred at a point in time depending on the delivery terms. Software licenses are either sold together with the hardware or sold separately. Control in case of software is transferred when the customer is able to use the software.

In case of service level agreements or maintenance contracts as well as period-related software licenses revenue is recognized over a period of time provided that further services are to be rendered during the term of the contract. The customer receives and uses all services at the same time as they are provided by the company.

Bill-and-hold arrangements or consignment stores are recognized when the performance obligation to transfer a product are met and the customer obtains control.

Transaction price
In general, the transaction price is the price from the order further considering the specific arrangements of the underlying contract. For contracts that contain multiple performance obligations, the transaction price is allocated to the individual performance obligations based on the relative individual selling price. A consideration to be paid to a customer is recorded as a reduction in the transaction price, hence reducing revenues, unless the payment relates to a specific delivery of goods by the customer or service provided by the customer.

The transaction price from a contract may contain fixed and/or variable components.

With regard to financial components, the practical remedy of not taking into account the effects of a financing component is applied if the maximum duration of the period between transfer of goods or services and payment by the customer does not exceed one year.

The group does not adjust any of the transaction prices for the time value of money.

Contract assets and liabilities
A contract asset is recognized when ADVA has transferred the goods or services. The contract asset is recognized as a receivable if an unconditional payment entitlement of the company exists.

A contract liability is recognized if the company receives the consideration before it has delivered the goods or services. This applies in particular to advance payments for service level agreements and maintenance contracts.

Contract assets and liabilities related to one contract are netted and shown as either contract assets or contract liability.

Volume discounts are incentive programs that offer the customer the option to receive free or discounted goods or services.

In addition, certain customers have the benefit of customer loyalty programs which result in the recognition of a contract liability and reduction of revenues based on the relative individual selling price.

Volume rebates can be identified as incentive programs where the company makes a payment to the customer once a specified sales volume has been achieved with the customer. Volume rebates are not related to separate performance obligations but are considered as a variable component of the transaction price.

Rights of return are considered in the transaction price on the basis of the historical selling price.

The company has made use of the option to recognize all costs in relation to conclude and extend a contract which would be amortized over a period of maximum one year upon activation, directly in profit and loss. This concerns all such costs.

Warranties
Exclusively all warranties are so-called "assurance type" warranties and therefore do not form separate performance obligations. For these essentially legal warranties, accruals according to IAS 37 are considered.

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COST OF GOODS SOLD

The cost of goods sold comprises the costs incurred in the production and rendering of services. This item subsumes both the direct cost of materials and production directly assignable to a product and indirect (overhead) costs, including the depreciation of production equipment, amortization of production related intangible assets and write-downs on inventories. The cost of goods sold also includes appropriation to the warranty provision and amortization of purchased technologies. Income from the reversal of write-downs on inventories reduces the cost of goods sold.

INTEREST INCOME AND EXPENSES

For all financial instruments measured at amortized cost, interest income or expenses are recorded using the effective interest rate, which is the rate that exactly discounts the estimated future cash payments or receipts through the expected life of the financial instrument or a shorter period, where appropriate, to the net carrying amount of the financial asset or liability.

TAXES

Current income tax

Current income tax assets and liabilities for the current and prior periods are measured at the amount expected to be recovered from or paid to the taxation authorities. The tax rates and tax laws used to compute the amount are these that are enacted or substantively enacted on the respective balance sheet date.

Deferred income tax

Deferred tax is provided using the liability method on temporary differences at the balance sheet date between the tax bases of assets and liabilities and their carrying amounts for financial reporting purposes.

Deferred tax liabilities are recognized for all taxable temporary differences, except:

- where the deferred income tax liability arises from the initial recognition of goodwill or of an asset or liability in a transaction that is not a business combination and, at the time of the transaction, affects neither the accounting profit nor taxable profit or loss; and
- in respect to taxable temporary differences associated with investments in subsidiaries, where the timing of the reversal of the temporary differences can be controlled and it is probable that the temporary differences will not reverse in the near future.

Deferred tax assets are recognized for all deductible temporary differences, carry forward of unused tax credits and unused tax losses, to the extent that it is probable that taxable profit will be available against which the deductible temporary differences, and the carry forward of unused tax credits and unused tax losses can be utilized, except:

- where the deferred tax asset related to the deductible temporary difference arises from the initial recognition of an asset or liability in a transaction that is not a business combination and, at the time of the transaction, affects neither the accounting profit nor taxable profit or loss; and
- in respect of deductible temporary differences associated with investments in subsidiaries, deferred tax assets are recognized only to the extent that it is probable that the temporary differences will reverse in the foreseeable future and taxable profit will be available against which the temporary differences can be utilized.

The carrying amount of deferred tax assets is reviewed on each balance sheet date and reduced to the extent that it is no longer probable that sufficient taxable profit will be available to allow all or part of the deferred tax asset to be utilized. Unrecognized deferred tax assets are reassessed on each balance sheet date and are recognized to the extent that it has become probable that future taxable profit will allow the deferred tax asset to be utilized.

Deferred tax assets and liabilities are measured at the tax rates that are expected to apply to the year when the asset is realized or the liability is settled, based on tax rates (and tax laws) that have been enacted or substantively enacted on the balance sheet date. Future changes in tax rates are recognized on the balance sheet date if their impact is materially certain as part of the tax legislation process.

According to IAS 12.74 deferred tax assets and liabilities have been set off in 2018 insofar as offsetting qualifications apply.

EARNINGS PER SHARE

The group calculates basic and diluted earnings per share in accordance with IAS 33. Basic earnings per share are calculated based on the weighted average number of no- par value shares outstanding during the reporting period. Diluted earnings per share are calculated based on the weighted average number of no-par value shares outstanding during the reporting period, but also including the number of no-par value shares that could come into existence if all stock options were exercised on the balance sheet date.

(7) Significant accounting judgments, estimates and assumptions

The preparation of the group's financial statements requires management to make judgments, estimates and assumptions that affect the reported amounts of revenues, expenses, assets and liabilities and the disclosure of contingent liabilities on the reporting date. However, uncertainty about these assumptions and estimates could result in outcomes that could require a material adjustment to the carrying amount of the asset or liability affected in the future. Assumptions used to make estimates are regularly reviewed. Changes in estimates only affecting one accounting period are only taken into account in that accounting period. In the case of changes in estimates that affect the current and future accounting periods, these are taken into account appropriately in the current and subsequent accounting periods.

Discussed below are the key judgments and assumptions concerning the future and other key sources of estimation and uncertainty on the balance sheet date that have a significant risk of causing a material adjustment to the carrying amounts of assets and liabilities within the next financial year.

DEVELOPMENT EXPENSES

Development expenses are capitalized in accordance with the accounting policy described in note (6). Initial capitalization of costs is based on management's judgment that technological and economic feasibility is confirmed, usually when a product development project has reached a defined milestone according to an established project management model. In determining the amounts to be capitalized, management makes assumptions regarding the expected future cash generation of the assets, discount rates to be applied and the expected period of benefits. See note (15) for the carrying amounts involved.

IMPAIRMENT OF NON-FINANCIAL ASSETS

The group assesses whether there are any indicators of impairment for all non-financial assets on each reporting date. Goodwill and other indefinite life intangibles are tested for impairment annually and at other times when such indicators exist. Other non-financial assets are tested for impairment when there are indicators that the carrying amounts may not be recoverable. When value-in-use calculations are undertaken, management must estimate the expected future cash flows from the asset or cash generating unit and choose a suitable discount rate in order to calculate the present value of these cash flows. See note (15) for the carrying amounts involved.

PENSION OBLIGATIONS

Pension and similar post-employment obligations as well as the related expenses are recognized based on actuarial calculations. The actuarial valuation of the present value of pension obligations depends on a number of assumptions regarding the discount rate, the expected salary increase rate, the expected pension trend, and life expectancy. In the event that changes in the assumptions regarding the valuation parameters are required, the future amounts of the pension obligations as well as the pension benefit costs may be affected materially. For further details on the valuation of pension obligations, see note (18).

SHARE-BASED COMPENSATION TRANSACTIONS

The group measures the cost of equity-settled and cash-settled transactions with employees by reference to the fair value of the equity instruments on the date at which they are granted or on the balance sheet date. Estimating fair value requires determining the most appropriate valuation model for a grant of equity instruments, which is dependent on the terms and conditions of the grant. This also requires determining the expected life of the option, volatility and dividend yield, as well as further assumptions. See note (38) for the carrying amounts involved.

PROVISIONS

Significant estimates are involved in the determination of provisions related to warranty costs and legal proceedings. The estimate of warranty claims is based on historic data and is extrapolated into the future. Legal proceedings often involve complex legal issues and are subject to substantial uncertainties. Accordingly, management exercises considerable judgment in determining whether there is a present obligation as a result of a past event at the end of the reporting period, whether it is more likely than not that such a proceeding will result in an outflow of resources and whether the amount of the obligation can be reliably estimated. Other provisions are described in note (19).

TRANSACTION PRICE FOR CUSTOMER LOYALTY PROGRAMS

Points accumulated for purchases provide a material right to customers that they would not receive without entering into a contract. The transaction price is allocated to the product and the points on a relative stand-alone selling price basis. Management estimates the selling price per point on the basis of the discount granted when the points are redeemed and on the basis of the likelihood of redemption, based on past experience.

TAXES

Uncertainties exist with respect to the interpretation of complex tax regulations and the amount and timing of future taxable income. Given the wide range of international business relationships and the long-term nature and complexity of existing contractual agreements, differences arising between the actual results and the assumptions made, or future changes to such assumptions, could necessitate future adjustments to tax income and expenses already recorded. The group establishes provisions, based on reasonable estimates, for possible consequences of audits by the tax authorities of the respective countries in which it operates. The amount of such provisions is based on various factors, such as experience of previous tax audits and differing interpretations of tax regulations by the taxable entity and the responsible tax authority. Such differences of interpretation may arise on a wide variety of issues depending on the conditions prevailing in the respective group company's domicile.

Deferred tax assets are recognized for all unused tax losses to the extent that it is probable that taxable profit will be available to utilize these losses. Significant management judgment is required to determine the amount of deferred tax assets that can be recognized, based upon the likely timing and level of future taxable profits together with future tax planning strategies. See note (26) for the carrying amounts involved.

(8) Principles of consolidation, scope of consolidation and shareholdings

Subsidiaries are all entities over which ADVA Optical Networking SE directly or indirectly has control. Subsidiaries are fully consolidated from the date on which control is transferred to the group. ADVA Optical Networking SE controls an entity when it is exposed to or has the rights to variable returns from its involvement and has the ability to affect those returns through its power to direct the activities of the entity.

Intercompany revenues, expenses, income, receivables and payables within the group are netted.

Intercompany profits that arise from deliveries of products and services provided within the group are eliminated.

BUSINESS COMBINATIONS

Business combinations from January 1, 2010 are accounted for using the acquisition method. The cost of an acquisition is measured as the aggregate of the consideration transferred, measured at acquisition date fair value and the amount of any non-controlling interest in the acquiree. For each business combination, the acquirer measures the non-controlling interest in the acquiree either at fair value or at the proportionate share of the acquiree's identifiable net assets. Acquisition costs incurred are expensed.

When a group company acquires a business, it assesses the financial assets and liabilities acquired for appropriate classification and designation in accordance with the contractual terms, economic circumstances and relevant conditions on the acquisition date. This includes the separation of embedded derivatives in host contracts by the acquiree.

If the business combination is achieved in stages, the acquisition date fair value of the acquirer's previously held equity interest in the acquiree is re-measured to fair value on the acquisition date through profit and loss.

Any contingent consideration to be transferred by the acquirer will be recognized at fair value on the acquisition date. Subsequent changes to the fair value of the contingent consideration that is deemed an asset or liability will be recognized in accordance with IAS 39 either in profit or loss or as a change to other comprehensive income. Subsequent changes in the fair value of contingent considerations that represent an asset or liability are recognized in the income statement in accordance with IFRS 9.

Goodwill is initially measured at cost being the excess of the consideration transferred over the group's net identifiable assets acquired and liabilities assumed. If this consideration is lower than the fair value of the net assets of the company acquired, the difference is recognized in profit or loss after reassessment.

After initial recognition, goodwill is measured at cost less any accumulated impairment losses. For the purpose of impairment testing, goodwill acquired in a business combination is, from the acquisition date, allocated to each of the group's cash generating units that are expected to benefit from the combination, irrespective of whether other assets or liabilities of the acquiree are assigned to those units.

Where goodwill forms part of a cash-generating unit and where part of the operation within that unit is disposed of, the goodwill associated with the operation disposed of is included in the carrying amount of the operation when determining the gain or loss on disposal of the operation. Goodwill disposed of in this circumstance is measured based on the relative values of the operation disposed of and the portion of the cash-generating unit retained.

INVESTMENTS IN ASSOCIATES AND IN JOINT VENTURES

The equity method according to IAS 28 (Investments in Associates) is used to account for investments in entities in which ADVA Optical Networking SE holds 20% to 50% of the voting rights, either directly or indirectly, and over whose operating and financial policy decisions ADVA Optical Networking SE exercises significant influence (associated companies). The investment is initially recognized at cost, and the carrying amount is increased or decreased to recognize the investor's share of the profit or loss generated. The group share of the profit or loss of investments accounted for by the equity method is recognized in the consolidated income statement, whereas the share of changes in the equity of investments accounted for by the equity method that has not been recognized in profit or loss is shown in the reserves of the consolidated equity. In case the group share of losses exceeds the carrying amount of the investment accounted for by the equity method, no further losses are recognized at group level. Goodwill relating to an investment accounted for by the equity method is included in the carrying amount of the investment. Upon loss of significant influence over an associate, the group measures and recognizes any retaining investment at its fair value. Upon loss of significant influence, any difference between the carrying amount of the associate and the fair value of the retaining investment and proceeds from disposal are recognized in profit or loss.

As of December 31, 2018, ADVA Optical Networking has no interests in associates and joint ventures.

SCOPE OF CONSOLIDATION

The consolidated financial statements for the year ended December 31, 2018, include the financial statements of ADVA Optical Networking SE plus all of the 23 (27 on December 31, 2017) wholly-owned subsidiaries listed below (hereafter collectively referred to as “the group companies”):

(in thousands)			Equity	Net income/(loss)	Share in equity owned directly	Share in equity owned indirectly
ADVA Optical Networking North America, Inc., Norcross/Atlanta (Georgia), USA (ADVA Optical Networking North America)	USD	*	120,567	54,109	-	100%
ADVA Optical Networking Ltd., York, United Kingdom (ADVA Optical Networking York)	GBP	**	13,830	1,446	100%	-
Oscilloquartz SA, Saint-Blaise, Switzerland (OSA Switzerland)	CHF	*	8,599	502	100%	-
ADVA Optical Networking sp. z o.o., Gdynia, Poland (ADVA Optical Networking Poland)	PLN	**	27,531	2,637	100%	-
ADVA Optical Networking Israel Ltd., Ra’anana/Tel Aviv, Israel (ADVA Optical Networking Israel)	ILS	*	-93,801	27,333	100%	-
ADVA Optical Networking (Shenzhen) Ltd., Shenzhen, China (ADVA Optical Networking Shenzhen)	CNY	**	54,187	4,463	100%	-
Oscilloquartz Finland Oy, Espoo, Finland (OSA Finland)	EUR	*	80	37	100%	-
ADVA IT Solutions Pvt. Ltd., Bangalore, India (ADVA IT Solutions)	INR	*	66,805	-168	-	100%
ADVA Optical Networking Trading (Shenzhen) Ltd., Shenzhen, China (ADVA Optical Networking Trading)	USD	*	1,156	204	-	100%
ADVA Optical Networking Singapore Pte. Ltd., Singapore (ADVA Optical Networking Singapore)	SGD	**	3,406	180	100%	-
ADVA Optical Networking Hong Kong Ltd., Hong Kong, China (ADVA Optical Networking Hong Kong)	HKD	**	4,391	735	-	100%
ADVA Optical Networking (India) Private Ltd., Gurgaon, India (ADVA Optical Networking India)	INR	*	101,033	39,678	1%	99%
ADVA Optical Networking Serviços Brazil Ltda., São Paulo, Brazil (ADVA Optical Networking São Paulo)	BRL	*	1,659	227	99%	1%
ADVA Optical Networking Corp., Tokyo, Japan (ADVA Optical Networking Tokyo)	JPY	*	83,985	866	100%	-
ADVA Optical Networking AB, Kista/Stockholm, Sweden (ADVA Optical Networking Stockholm)	SEK	**	1,902	174	100%	-
ADVA NA Holdings Inc., Norcross/Atlanta (Georgia), USA (ADVA NA Holdings)	USD	*	60,717	95	100%	-
ADVA Optical Networking Pty Ltd., Sydney (New South Wales), Australia (ADVA Australia)	AUD	*	1,369	10	-	100%
MRV Communications GmbH i. l., Darmstadt, Germany (MRV Germany)	EUR	*	-5,424	38	-	100%
ADVA Optical Networking B.V., LA Etten-Leur, Netherlands (ADVA Netherlands)	EUR	*	238	13	100%	-
Charlotte’s Web Ltd., Israel	USD	*	-52,520	663	-	100%
NBase Communications Ltd.	USD	*	16,920	-1	-	100%
Jolt Ltd., Israel	USD	**	0	6,129	-	100%
NBase Fibronics Ltd., Israel	USD	*	-3,746	78	-	100%

* Prepared in accordance with the International Financial Reporting Standards (IFRS) for the financial year ended December 31, 2018.

** Prepared in accordance with local commercial law for the financial year ended December 31, 2017.

CHANGES IN THE SCOPE OF CONSOLIDATION

Final purchase price allocation regarding the acquisition of MRV Communications Inc.

In 2018, the following adjustments to the preliminary purchase price allocation from the acquisition of MRV Communications group have been considered resulting in a total decrease of goodwill amounting to EUR 131 thousand at the date of the acquisition (August 12, 2017).

The valuation of the obligation for outstanding vacation days has been adjusted. This resulted in an increase of the liability for outstanding vacation days of EUR 324 thousand (USD 381 thousand) and a respective increase in goodwill from the acquisition.

Deferred tax assets on loss carry-forwards in the US amounting to EUR 858 thousand (USD 1,029 thousand) have been recognized in the opening balance sheet. Moreover, at the same date, the deferred tax liabilities related to the purchase price allocation have been reduced to EUR 3,507 thousand (USD 4,206 thousand) and an additional provision for tax risks amounting to EUR 3,910 thousand (USD 4,601 thousand) has been considered. In total these adjustments resulted in a decrease of goodwill from the acquisition.

Thereby the analysis of tax and other balance sheet positions of MRV group at the date of the acquisition has been finalized. On December 31, 2018, the respective amounts will be reported net in line with the offsetting of deferred tax assets and liabilities.

According to IFRS 3.49 prior period information in the balance sheet has been adjusted accordingly.

The final fair values of acquired assets and liabilities at the date of the acquisition and carrying amounts immediately prior to the date of the acquisition comprise as follows:

(in thousands of EUR)	Carrying amount	Fair value at the date of the acquisition
Cash and cash equivalents	20,705	20,705
Trade accounts receivable	11,029	11,029
Inventory	4,649	6,754
Property, plant and equipment and other intangible assets	3,597	3,968
Purchased technologies	-	8,959
Acquired customer relationships	-	12,699
Other current and non-current assets	1,258	1,258
Trade accounts payable	-4,808	-4,808
Provisions and other current and non-current liabilities	-24,595	-28,506
Deferred revenues	-	-1,385
Deferred tax assets	-	858
Deferred tax liabilities	-	-4,845
Net assets	**11,835**	**26,686**
Goodwill		**30,232**
Purchase price		**56,918**

The preliminary net cash outflow from the acquisition is unchanged compared to the preliminary reporting as of December 31, 2017, and comprised as follows:

(in thousands of EUR)	
Cash and cash equivalents acquired from MRV group	20,705
Cash paid in acquisition	-56,918
Preliminary cash outflow from the acquisition	**-36,213**

Mergers

MRV Communications Inc., Chatsworth (California), USA und MRV Communications Americas Inc., Chelmsford (Massachusetts), USA were merged to ADVA Optical Networking North America on April 1, 2018.

MRV Communications Ltd., Yokneam, Israel und MRV International Ltd., Yokneam, Israel were merged to ADVA Optical Networking Israel on April 1, 2018. Functional currency was changed from USD in financial year 2017 to ILS in financial year 2018.

(9) Foreign currency translation

The functional currency of each group company is the currency of the main economic environment in which the company operates. The reporting currency of ADVA Optical Networking’s consolidated financial statements is the functional currency of the parent company, ADVA Optical Networking SE (EUR).

Transactions in foreign currencies are initially recorded by the group entities at their respective functional currency rates prevailing on the date of the transaction. Monetary assets and liabilities denominated in foreign currencies are retranslated at the functional currency spot rate of exchange ruling on the reporting date. Non-monetary items that are measured in terms of historical cost in a foreign currency are translated using the exchange rates on the dates of the initial transactions. Non-monetary items measured at fair value in a foreign currency are translated using the exchange rates on the date when the fair value is determined. The exchange differences arising from the translation are recognized in profit of loss in financial income/expense.

The assets and liabilities of foreign operations are translated into EUR at the rate of exchange prevailing on the reporting date, and their income statements are translated at the average rate for the reporting period. The exchange differences arising from the translation are recognized in accumulated other comprehensive income. On disposal of a foreign operation, the component of accumulated other comprehensive income relating to that particular foreign operation is recognized in the income statement.

Any goodwill arising on the acquisition of a foreign operation and any fair value adjustments to the carrying amount of assets and liabilities arising on acquisition are treated as assets and liabilities of the foreign operation and translated at the closing rate.

The relevant currency translation rates to EUR are listed below:

	Closing rate Dec. 31, 2018	Closing rate Dec. 31, 2017	Average rate Jan. 1 to Dec. 31, 2018	Average rate Jan. 1 to Dec. 31, 2017
AUD*	1.6215	1.5346	1.5798	1.5184
BRL	4.4427	3.9729	4.3068	3.6064
CHF	1.1227	1.1702	1.1551	1.1116
CNY	7.8778	7.8044	7.8063	7.6271
GBP	0.9027	0.8872	0.8848	0.8764
HKD	8.9716	9.3720	9.2574	8.8010
ILS	4.3128	4.1635	4.2425	4.0609
INR	80.2255	76.6055	80.6685	73.4943
JPY	126.4000	135.0100	130.3944	126.6635
PLN	4.3028	4.1770	4.2609	4.2570
SEK	10.2773	9.8438	10.2603	9.6372
SGD	1.5642	1.6024	1.5925	1.5583
USD	1.1454	1.1993	1.1812	1.12926

* MRV Australia was acquired on August 12, 2017. The average exchange rate for 2017 considers the period from August 12 to December 31, 2017.

Notes to the consolidated statement of financial position

(10) Cash and cash equivalents

Cash and cash equivalents include current funds as well as current financial assets with an original remaining maturity that does not exceed three months. On December 31, 2018 and 2017 cash and cash equivalents include EUR 334 thousand and EUR 277 thousand, respectively, to which ADVA Optical Networking has only limited access.

On December 31, 2018, cash of EUR 2,759 thousand (December 31, 2017: EUR 1,491 thousand) is held in China and is subject to local exchange control regulations. These local exchange control regulations provide for restrictions on exporting capital from the country, other than through normal dividends.

Cash at banks earns interest at floating rates based on daily bank deposit rates.

Cash equivalents are invested for varying periods of between one day and three months, depending on the immediate cash requirements of the group, and earn interest at the respective short-term deposit rates.

On December 31, 2018, the group had EUR 10,000 thousand (on December 31, 2017: EUR 8,000 thousand) of undrawn committed borrowing facilities available in respect of which all conditions had been met.

(11) Trade accounts receivable

Trade accounts receivable are non-interest-bearing and are due within 30 to 120 days in general. For specific projects, other payment terms may be agreed.

Gross and net trade accounts receivable are as follows:

(in thousands of EUR)	2018	2017
Gross trade accounts receivable	98,574	82,115
Depreciation	-638	-788
Nettobestand	97.936	81.327

A reconciliation of the risk provision for trade accounts receivables is included in the table below:

(in thousands of EUR)	2018
Jan. 1	961
Release	-356
Usage	10
Foreign currency translation effects	23
Dec. 31	638

The impairment loss of EUR 510 thousand as at December 31, 2017 was recognized in the income statement in selling and marketing expenses.

Further information on default risk from trade receivables is included in note (33) on financial risk management.

The group entered into a supplier finance agreement, whereby it can finance receivables from a specific customer. Credit risks and settlement risks are transferred to the financing institution. The group paid an annual fee amounting to LIBOR plus 0.75% on the volume of receivables transferred. In 2018, the group incurred interest expenses of EUR 119 thousand pertaining to this arrangement (prior year: EUR 135 thousand).

On December 31, 2018, trade accounts receivables amounting to EUR 4,251 thousand are included, for which an agreement for the sale of trade accounts receivable exists (December 31, 2017: EUR 1,690 thousand).

(12) Inventories

The table below summarizes the composition of inventories on December 31:

(in thousands of EUR)	2018	2017
Raw materials and supplies	13,877	16,799
Work in progress	3,271	3,028
Finished goods	68,586	61,867
	85,734	81,694

In 2018, depreciation of inventories amounting to EUR 4,751 thousand (prior year: EUR 7,303 thousand) was recognized as an expense within cost of goods sold. This amount includes reversals of earlier write-downs amounting to EUR 300 thousand (prior year: EUR 617 thousand) due to higher selling and input prices.

In 2018 and 2017, material costs of EUR 231,385 thousand and EUR 260,230 thousand, respectively, have been recognized.

(13) Contract assets

The contract assets amounting to EUR 320 thousand relate to a service contract with a customer in the USA. Contract assets are subject to the impairment requirements of IFRS 9, but the identified impairment losses were insignificant.

(14) Other current and non-current assets

On December 31, other current assets analyze as follows:

(in thousands of EUR)	2018	2017
Non-financial assets		
Prepaid expenses	2,798	3,723
Receivables due from tax authorities	2,054	1,881
Other	771	408
Total current non-financial assets	5,623	6,012
Financial assets		
Government grant allowances for research projects	2,097	2,630
Positive fair values of derivative financial instruments	108	12
Investments for sale	393	-
Other	678	1,150
Total current financial assets	3,276	3,792
	8,899	9,804

Other current assets are non-interest-bearing and are generally due within 0 to 60 days.

Further disclosures on derivative financial instruments are given in note (32).

On December 31, other non-current assets analyze as follows:

(in thousands of EUR)	2018	2017
Non-financial assets		
Other	-	26
Total non-current non-financial assets	-	26
Financial assets	-	
Investments	1,374	1,374
Government grant allowances for research projects	275	618
Other	1,456	1,723
Total non-current financial assets	3,105	3,715
	3,105	3,741

Investments relate to 7.1% of the shares of Saguna Networks Ltd. Nesher, Israel, held by ADVA Optical Networking SE (prior year: 7.9% of the shares).

On December 31, 2018, government grants for thirteen research projects are recognized (December 31, 2017: thirteen research projects). These public grants relate to programs promoted by the EU and national governments.

The classification of financial instruments according to IFRS 9 is included in note (32).

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(15) Fixed assets

The following changes in fixed assets were recorded in 2018 and 2017:

	Historical cost							Accumulated depreciation								Net book values	
(in thousands of EUR)	Jan. 1, 2018	Additions	Disposals/ retirements	Reclassifications	Currency translation adjustments	Change in scope of consolidation	Dec. 31, 2018	Jan. 1, 2018	Deprecia-tion of the period	Impairment of the period	Deprecia-tion on disposals/ retirements	Reclassifications	Currency translation adjustments	Change in scope of consolidation	Dec. 31, 2018	Dec. 31, 2018	Dec. 31, 2017
Finance leases	2,460	-	-118	-	0	-	2.342	2,460	-	-	-118	-	0	-	2.342	-	-
Property, plant and equipment																	
Land and buildings	15,876	526	-417	3	77	-	16.065	8,935	1,173	-	-338	-	99	-	9,869	6,196	6,941
Technical equipment and machinery	79,943	11,248	-3,512	212	819	-	88,710	62,841	8,724	-	-3,187	-	716	-	69,094	19,616	17,102
Factory and office equipment	14,487	1,560	-435	-1	11	-	15,622	11,872	1,604	-	-429	-	18	-	13,065	2,557	2,615
Assets under construction	240	695	-	-260	8	-	683	-	-	-	-	-	-	-	-	683	240
	110,546	14,029	-4,364	-46	915	-	121,080	83,648	11,501	-	-3,954	-	833	-	92,028	29,052	26,898
Intangible assets																	
Goodwill	114,310	-	-	-	2,052	-	116,362	46,274	-	-	-	-	-312	-	45,962	70,400	68,036
Capitalized development projects	261,104	31,872	-	-	-256	-	292,720	175,929	29,124	-	-	-	-259	-	204,794	87,926	85,175
Intangible assets acquired in business combinations	72,673	-	-	-	2,424	-	75,097	42,168	5,526	-	-	-	1,391	-	49,085	26,012	30,505
Other intangible assets	60,150	2,367	-	46	118	-	62,681	53,870	3,216	-	-	-	83	-	57,169	5,512	6,280
	508,237	34,239	-	46	4,338	-	546,860	318,241	37,866	-	-	-	903	-	357,010	189,850	189,996
	621,243	48,268	-4,482	-	5,253	--	670,282	404,349	49,367	-	-4,072	-	1,736	-	451,380	218,902	216,894

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	Historical cost							Accumulated depreciation								Net book values	
(in thousands of EUR)	Jan. 1, 2017	Additions	Disposals/ retirements	Reclassifications	Currency translation adjustments	Change in scope of consolidation	Dec. 31, 2017	Jan. 1, 2017	Deprecia-tion of the period	Impairment of the period	Deprecia-tion on disposals/ retirements	Reclassifications	Currency translation adjustments	Change in scope of consolidation	Dec. 31, 2017	Dec. 31, 2017	Dec. 31, 2016
Property, plant and equipment Land and buildings	2,543	-	-81	-	-2	-	2,460	2,543	-	-	-81	-	-2	-	2,460	-	-
Technical equipment and machinery																	
Factory and office equipment	16,140	119	-17	-	-461	95	15,876	8,071	1,195	-	-15	-	-316	-	8,935	6,941	8,069
Assets under construction	75,830	8,866	-3,971	141	-3,317	2,394	79,943	62,123	7,229	-	-3,686	-	-2,825	-	62,841	17,102	13,707
Betriebs- und Geschäftsausstattung	13,964	1,381	-462	3	-525	126	14,487	11,062	1,699	-	-458	-	-431	-	11,872	2,615	2,902
Anlagen im Bau	448	193	-3	-389	-12	3	240	-	-	-	-	-	-	-	-	240	448
	106,382	10,559	-4,453	-245	-4,315	2,618	110,546	81,256	10,123	-	-4,159	-	-3,572	-	83,648	26,898	25,126
Intangible assets																	
Goodwill	89,082	-	-	-	-5,003	30,231	114,310	47,544	-	-	-	-	-1,270	-	46,274	68,036	41,538
Capitalized development projects	222,614	39,033	-	-	-543	-	261,104	146,351	25,812	4,261	-	-	-495	-	175,929	85,175	76,263
Intangible assets acquired in business combinations	55,670	-	-	-	-4,655	21,658	72,673	41,386	4,065	361	-	-	-3.644	-	42.168	30.505	14.284
Other intangible assets	56,254	4,981	-2,401	245	-279	1,350	60,150	54,109	2,242	-	-2,286	-	-195	-	53,870	6,280	2,145
	423,620	44,014	-2,401	245	-10,480	53,239	508,237	289,390	32,119	4,622	-2,286	-	-5,604	-	318,241	189,996	134,230
Financial investments																	
Investments in associates and joint ventures	1,208	-	-1,062	-	-146	-	-	1,208	-	-	-1,062	-	-146	-	-	-	-
	1,208		-1,062	-	-146	-	-	1,208	-	-	-1,062	-	-146	-	-	-	-
	533,753	54,573	-7,997	-	14,943	55,857	621,234	374,397	42,242	4,622	-7,588	-	-9,324	-	404,349	216,894	159,356

Property, plant and equipment
The classification and changes in property, plant and equipment are shown in the analysis of changes in fixed assets.

In 2018 and 2017, there were neither impairments nor write-backs of property, plant and equipment impaired in prior years.

In 2018, the group received no government grants for property, plant and equipment (prior year: EUR 90 thousand). Based on grant allowances no allowances have been deducted from historical costs in 2018 (prior year: nil).

Goodwill
The table below shows the composition of goodwill allocated to cash-generating units on December 31:

(in thousands of EUR)	2018	2017
ADVA Optical Networking SE plus	37,991	37,991
ADVA Optical Networking York	6,841	6,841
ADVA Optical Networking North America	24,579	24,579
OSA Switzerland	2,801	2,801
Effect of foreign currency translation	-1,812	-4,176
	70,400	68,036

Impairment of goodwill
In 2018 and 2017, no impairment of goodwill was recognized.

Key assumptions used in impairment testing
All entities, which are largely capable to generate revenues independently based on own customer relationships and own distribution channels are considered as separate cash-generating units. All dependent development service providing and sales service providing entities are considered together with the ADVA Optical Networking SE in one combined cash-generating unit (ADVA Optical Networking SE plus) as ADVA Optical Networking as owner of all technologies is responsible for future developments and utilization. For impairment test purposes goodwill is generally allocated to the cash-generating unit in which the subsidiary is included, on which acquisition the goodwill has been recognized. 61% of the goodwill recognized in the course of the acquisition of Overture Networks Inc. has been allocated to ADVA Optical Networking SE plus and 39% has been allocated to ADVA Optical Networking North America based on fair value of technology and customer relationship at the date of the acquisition. 50% of technologies and 40% of customer relationships recognized in the purchase price allocation as well as 45% of goodwill related to the acquisition of MRV group have been allocated to ADVA Optical Networking North America. Unchanged from prior years, the cash-generating units, to which the corporate assets are allocated, are ADVA Optical Networking SE plus, ADVA Optical Networking York, ADVA Optical Networking North America and OSA Switzerland.

On December 31, 2018 and 2017, the value in use of the goodwill was calculated based on future cash flows (discounted-cash-flow-method). The calculation is most sensitive to the following assumptions:

- Gross margins
- Discount rates
- Raw material prices
- Market share expected

Cash flows include the projected cash flows for the three subsequent years as per the approved budget and four-year planning for gross margins, market share and raw material prices. For further periods, a perpetual income is estimated based on nil growth with inflation offset. The discount rate used for the calculation is a pre-tax rate. It considers the specific risk of each group company and is calculated according to the Capital Asset Pricing Model (CAPM). The cost of equity is composed of a risk-free interest rate and a specific risk mark-up calculated as the difference of the average market rate of return and the risk-free interest rate multiplied with the specific risk related to the company (beta coefficient). The beta coefficient is calculated on a peer group basis. The calculation uses pre-tax discount rates depending on the different cash generating units.

Following pre-tax discount rates have been assumed:

(in %)	2018	2017
ADVA Optical Networking SE plus	13.70	17.19
ADVA Optical Networking York	14.54	16.72
ADVA Optical Networking North America	19.50	17.35
OSA Switzerland	11.11	14.62

Sensitivity analysis
As an impairment is unlikely as of the balance sheet date, no information on sensitivities is provided.

Capitalized development projects, intangible assets acquired in business combinations and other intangible assets
The table below summarizes the carrying amounts:

(in thousands of EUR)	Dec. 31, 2018	Dec. 31, 2017
Capitalized development projects	87,926	85,175
Intangible assets acquired in business combinations	26,012	30,505
Other intangible assets	5,512	6,280
	119,450	121,960

In 2018, borrowing costs of EUR 359 thousand (2017: EUR 511 thousand) were capitalized related to development projects with an expected duration of more than 12 months. Borrowing costs were capitalized at the weighted average rate of the financial liabilities of 1.7%.

Other intangibles assets mainly include licenses and software.

Intangible assets acquired in business combinations analyze as follows:

(in thousands of EUR)	Dec. 31, 2018	Dec. 31, 2017
Purchased technology FiSEC	412	702
Purchased hardware technology Overture	1,145	2.203
Purchased software technology Overture	2,534	3.226
Purchased technology MRV	7,084	8,239
Brand Ensemble	86	128
Purchased customer relationships OSA	17	85
Purchased customer relationships Overture	3,422	3,917
Purchased customer relationship MRV	11,312	12,005
	26,012	30,505

Amortization of intangible assets with a finite useful life comprises:

(in thousands of EUR)	2018	2017
Capitalized development projects	29,124	30,073
Intangible assets acquired in business combinations	5,526	4,426
Other intangible assets	3,216	2,242
	37,866	36,741

Amortization of intangible assets acquired in business combinations analyze as follows:

(in thousands of EUR)	2018	2017
Purchased technology Biran	-	110
Purchased technology Time4 Systems	-	456
Purchased technology FiSEC	290	290
Purchased hardware technology Overture	1,057	1,057
Purchased software technology Overture	693	693
Purchased technology MRV	1,496	558
Brand Ensemble	43	43
Purchased customer relationships OSA	69	72
Purchased customer relationships Overture	658	688
Purchased customer relationship MRV	1,220	459
	5,526	4,426

Purchased technology Biran and Time4 Systems has been fully depreciated in 2017.

In 2018, no impairment for capitalized development projects as well as purchased technology was recognized (2017: EUR 4,622 thousand).

In the consolidated income statement, amortization and impairment of capitalized development projects and amortization of purchased technology is included in cost of goods sold. Amortization of purchased customer relationship assets is included in selling and marketing expenses.

The methodology for calculating impairment is the same as the one used for goodwill impairment testing. The key assumptions and key sensitivities are also the same.

(16) Financial liabilities

The tables below detail financial liabilities and their maturity:

(in thousands of EUR)	Dec. 31, 2018	Maturity ≤ 12 months	Maturity 13 to 36 months	Maturity > 36 months
IKB Deutsche Industriebank loans	12,500	6,250	6,250	-
	5,000	2,500	2,500	-
	7,500	3,750	3,750	-
Syndicated loan	64,484	6,900	21,705	35,879
Total financial liabilities	89,484	19,400	34,205	35,879

(in thousands of EUR)	Dec. 31, 2017	Maturity ≤ 12 months	Maturity 13 to 36 months	Maturity > 36 months
IKB Deutsche Industriebank loans	3,123	3,123	-	-
	18,750	6,250	12,500	-
	7,500	2,500	5,000	-
HSBC loan	12,188	12,188	-	-
Deutsche Bank bridge loan	55,000	55,000	-	-
Total financial liabilities	96,561	79,061	17,500	-

In Q1 2018, ADVA Optical Networking signed a loan with IKB (Industriekreditbank) amounting to EUR 11,250 thousand. The loan is repaid in 12 equal quarterly instalments from Q1 2018. Moreover, another two loans exist with IKB. A fixed interest rate of 1.4% applies. The loan agreement with HSBC amounting to EUR 11,250 thousand has been fully repaid in March 2018.

In September 2018, ADVA Optical Networking contracted a syndicated loan amounting to EUR 75,000 thousand with a banking syndicate. The new syndicated loan consists of two tranches with a total maturity of five years including a redeemable loan amounting to EUR 65,000 thousand as well as a revolving credit line of EUR 10,000 thousand. The initial interest rate for the redeemable loan amounts currently to EURIBOR plus 1.5%, linked to the performance of the group. The loan will be paid back in bi-annual instalments from June 2019. The redeemable loan has been accounted for applying the effective interest method.

The cash inflow from the first tranche of the syndicated loan was used to repay three short-term bridge loans of EUR 21,500 thousand, each, with Deutsche Bank and Norddeutsche Landesbank as well as EUR 12,000 thousand with Bayerische Landesbank at the end of Q3 2018. Moreover, a loan with Bayerische Landesbank of EUR 10,000 thousand has been early repaid in Q3 2018.

In 2018, the interest on financial liabilities recognized at year-end was between 1.40% und 1.50% per annum.

The fair value of the financial liabilities is stated in note (32).

(17) Trade accounts payable and other current and non-current liabilities

The trade accounts payable are non-interest-bearing and generally due within 30 to 90 days. The increase in trade accounts payable mainly results from demand-oriented purchases of materials.

Other current liabilities on December 31 analyze as follows:

(in thousands of EUR)	2018	2017
Non-financial liabilities		
Liabilities to employees for vacation	3,362	3,619
Liabilities due to withheld wage income tax and social security contribution	2,493	2,788
Liabilities due to tax authorities	1,985	1,441
Obligations from subsidized research projects	2,128	2,750
Other	271	470
Total current non-financial liabilities	10,239	11,068
Financial liabilities		
Liabilities to employees for variable compensation and payroll	16,125	14,118
Liabilities from stock appreciation rights	-	145
Other	1,973	1,805
Total current financial liabilities	18,098	16,068
	28,337	27,136

On December 31, other non-current liabilities include:

(in thousands of EUR)	2018	2017
Non-financial liabilities		
Obligations from subsidized research projects	571	1,226
Other	1,323	1,006
Total non-current non-financial liabilities	1,894	2,232
Financial liabilities		
Other	62	946
Total non-current financial liabilities	62	946
	1,956	3,178

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On December 31, 2018, other non-current non-financial liabilities primarily include deferred rental expense of EUR 1,303 thousand (prior year: EUR 980 thousand).

The classification of financial instruments according to IFRS 9 is included in note (32).

(18) Provisions for pensions and similar employee benefits

Post-employment benefit plans are classified as either defined contribution or defined benefit plans.

Plan assets related to defined contribution plans are managed separately from the assets of the relevant company by a trustee. For such plans, the company pays fixed contributions into a separate entity or a fund and does not assume any other obligations. Payment obligations to defined contribution plans are recognized in profit or loss when they occur. Payment to government managed pension plans with fixed contributions are considered as defined contribution plans. ADVA Optical Networking maintains defined contribution plans in different group companies. In 2018, total expenses related to defined contribution plans amount to EUR 6,110 thousand (prior year: EUR 1,347 thousand (without considering employer contributions to statutory pension insurance).

Under defined benefit plans the company is required to pay agreed benefits granted to present and past employees. Defined benefit plans may be funded or unfunded. The group maintains defined benefit plans in Switzerland, Italy, India and Israel.

The defined benefit plans in Switzerland and Israel are final salary related plans which in the case of Switzerland include a guaranteed minimum rate of return additionally. Benefits paid in conjunction with these plans comprise old-age retirement pensions as well as invalidity and surviving dependents' benefits. Trustees according to local statutory regulations administer the assets of these pension plans. The Italian and Indian defined benefit plans are unfunded and consider final salary assumptions.

On December 31, 2018, ADVA Optical Networking reports provisions for pensions amounting to EUR 5,531 thousand (December 31, 2017: EUR 5,822 thousand).

At year-end, the carrying amount analyzes as follows:

(in thousands of EUR)	2018	2017
Present value of defined benefit obligations	19,515	19,903
Fair value of plan assets	-13,984	-14,081
Provisions for pensions and similar employee benefits	5,531	5,822

The change in the net defined benefit liability for pension plans derives as follows:

(in thousands of EUR)	Defined benefit obligations	Fair value of plan assets	Total
Jan. 1, 2017	15,232	-10,527	4,705
Addition from changes in the scope of consolidation	4,935	-3,560	1,375
Expenses and income			
Current service cost	735	-	735
Interest expense (+)/income (-)	156	-106	50
Past service cost	-	-	-
Remeasurements			
Gains (-)/losses (+) arising from changes in financial assumptions	-174	-	-174
Gains (-)/losses (+) arising from experience	-109	-	-109
Gains (-)/losses (+) on plan assets, excluding amounts included in interest income	-	72	72
Employee contributions	412	-412	-
Transfers to funds		-513	-513
Benefits paid through plan assets	-74	74	-
Disbursements of ADVA Optical Networking	-49	-	-49
Exchange rate differences and other changes	-1,161	891	-270
Dec. 31, 2017	19,903	-14,081	5,822
Expenses and income			
Current service cost	880	-	880
Interest expense (+)/income (-)	271	-187	84
Past service cost	-255	-	-255
Remeasurements			
Gains (-)/losses (+) arising from changes in financial assumptions	-894	-	-894
Gains (-)/losses (+) arising from experience	407	-	407
Gains (-)/losses (+) on plan assets, excluding amounts included in interest income	-	161	161
Employee contributions	264	-264	-
Transfers to funds	-	-626	-626
Assets distributed on settlements	-	32	32
Benefits paid through plan assets	-1,270	1,270	-
Disbursements of ADVA Optical Networking	-165	-	-165
Exchange rate differences and other changes	374	-289	85
Dec. 31, 2018	19,515	-13,984	5,531

The past service cost in 2018 mainly results from the reduction of the conversion rates for the old-age capital achieved in Switzerland.

On December 31, 2018, EUR 18,248 thousand of the defined benefit obligations relate to active employees and EUR 1,268 thousand relate to pensioners (prior year: EUR 19.263 thousand and EUR 641 thousand, respectively).

The average remaining period of service for employees and the weighted average duration of the obligations as of December 31, 2018 are as follows:

(in years)	Switzerland	Italy	India	Israel
Average remaining period of service	10.6	15.5	9.1	n/a
Weighted average duration	17.7	12.7	6.6	12.2

At December 31, 2017 the average remaining period of service and the weighted average duration are as follows:

In Jahren	Switzerland	Italy	India	Israel
Average remaining period of service	10.7	16.5	9.5	n/a
Weighted average duration	18.7	13.5	7.6	9.5

In general, the monthly payment of pensions starts if an employee in Switzerland or Israel reaches the retirement age, while in Italy and India a lump sum payment of the relevant accrued amount applies with retirement or resignation of an employee.

Employer contributions in 2018 are expected to amount to EUR 679 thousand (prior year: EUR 483 thousand). The expected pension payments for 2019 amount to EUR 527 thousand, In the prior year pension payments of EUR 677 thousand had been expected for 2018.

In 2018, the defined benefit obligations are calculated on actuarial basis considering the following material assumptions for valuation parameters:

	Switzerland	Italy	India	Israel
Discount rate	1.00%	1.75%	7.40%	3.60%
Inflation rate	1.00%	1.75%	n/a	1.50%
Salary level trend	1.00%	2.00%	7.00%	2.00%

In 2017, the following valuation parameters have been assumed:

	Switzerland	Italy	India	Israel
Discount rate	0.75%	1.45%	7.50%	3.10%
Inflation rate	1.00%	1.75%	n/a	1.60%
Salary level trend	1.00%	2.00%	7.00%	2.00%

Discount rates have been determined considering the weighted average duration of the obligations. The evaluation for Switzerland and Italy is based on high-quality corporate bonds with AA-rating. For India, the discount rate is based on government bond rates.

ADVA Optical Networking is exposed to risks arising from defined benefit plans. Changes in actuarial parameters, especially in discount rates, may have significant influence on the pension obligations.

The sensitivity analysis provided below shows the extent to which the defined benefit obligation would have been affected by changes in the relevant assumptions in 2018:

(in thousands of EUR)		Change in defined benefit obligation
Discount rate	Increase by 0.25%	-659
	Decrease by 0.25%	702
Salary level trend	Increase by 0.25%	147
	Decrease by 0.25%	-149

The sensitivity analysis in prior year were as follows:

(in thousands of EUR)		Change in defined benefit obligation
Discount rate	Increase by 0.25%	-702
	Decrease by 0.25%	747
Salary level trend	Increase by 0.25%	211
	Decrease by 0.25%	-210

Sensitivities for discount rate and salary level trend have been considered in turn disregarding any potential dependencies between these assumptions. Separate actuarial computations have been performed for increase and decrease of the assumptions.

ADVA Optical Networking assumes inflation rate and pension entitlement trend to have minor impact on the amount of defined benefit obligations.

On December 31, 2018, plan assets split to major asset categories as follows:

	Quoted market prices	Other than quoted market prices
Equity instruments	18.49%	-
Bonds	19.81%	-
Real estate	18.48%	-
Alternative investments	7.26%	-
Qualified insurance policies	-	24.86%
Cash and cash equivalents	-	2.28%
Other	-	8.82%

On December 31, 2017, plan assets split to major asset categories as follows:

	Quoted market prices	Other than quoted market prices
Equity instruments	16.79%	-
Bonds	19.81%	-
Real estate	16.89%	-
Alternative investments	7.53%	-
Qualified insurance policies	-	26.27%
Cash and cash equivalents	-	3.61%
Other	-	9.10%

Pension fund assets are monitored continuously and managed from a risk-and-yield perspective by the external trustees.

(19) Other provisions

The table below lists changes in the composition of the group's other provisions in the reporting period:

(in thousands of EUR)	Jan. 1, 2018	Usage	Release	Appropriation	Transfer	Currency translation difference	Dec. 31, 2018
Current provisions							
Warranty provision	3,040	-1,300	-203	570	-	15	2,122
Personnel provisions	1,911	-1,330	-303	601	-	6	885
Consulting fees	4,567	-1,722	-115	680	6	135	3,551
Supplier obligations	11,299	-4,950	-500	6,787	-4,618	-59	7,959
Other short-term provisions	1,177	-2,002	-3,170	467	3,932	84	488
	21,994	-11,304	-4,291	9,105	-680	181	15,005
Non-current provisions							
Warranty provision	1,449	-232	-	203	-	-5	1,425
Other long-term provisions	29	-	-	-	-	-1	28
	1,478	-232	-	203	-	4	1,453
Provisions total	23,472	-11,536	-4,291	9,308	-680	185	16,458

The estimated expenses related to warranty claims reflect both past experience and current developments and are based on a percentage of sales revenues. Any differences between actual amounts and anticipated amounts are treated as changes in accounting estimates and affect earnings in the period in which the change occurs.

Current personnel provisions mainly include expenses for severance payments as well as employee's accident insurance and other expenses resulting from legal requirements.

In course of the first-time adoption of IFRS 15, liabilities in relation to expected volume discounts and refunds to customers presented in opening balance of other current provisions were reclassified in 2018 to contract liabilities. For further information see note (5) and (20).

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(20) Contract liabilities and refund liabilities

Due to the first-time adoption of IFRS 15, following liabilities are included in the new balance sheet positions current and non-current contract liabilities. Prior year disclosure has not been adjusted.

(in thousands of EUR)	Dec. 31, 2018	Dec. 31, 2017
Current contract liabilities		
Outstanding credit notes	-	n/a
Advance payments received	87	n/a
Current contract liabilities related to customer loyalty programs	460	n/a
Current deferred revenues related to service level agreements	13,514	n/a
	14,061	n/a
Current refund liabilities	511	n/a
Non-current contract liabilities		
Non-current deferred revenues related to service level agreements	6,469	n/a
	6,469	n/a
	21,041	n/a

Current contract liabilities related to customer loyalty programs include mainly expected volume discounts and refunds to customers amounting to EUR 460 thousand. In 2017, the liabilities amounting to EUR 680 thousand were presented in current provisions and liabilities amounting to EUR 142 thousand in relation to outstanding credit notes were previously presented as reduction from trade receivables.

The revenues generated in the reporting period from contract liabilities existing at the beginning of the period amounted to EUR 15,975 thousand (previous year: n/a).

Management expects that 69% of the outstanding (or partially outstanding) benefit obligations as of December 31, 2018, will be recognized as revenue in the 2019 financial year. As expected, the remaining 31% are recognized as sales in the financial year 2020. The amount stated does not include variable compensation components which are limited.

(21) Stockholders' equity

Common stock and share capital

On December 31, 2018, ADVA Optical Networking SE had issued 49,930,955 (prior year: 49,735,549) no par value bearer shares (hereinafter "common shares"), each representing a notional amount of share capital of EUR 1.00.

The common shares entitle the holder to vote at the annual general meeting and to receive dividends in case of a distribution. No restrictions are attached to the common shares.

Capital transactions

In connection with the exercise of stock options, 195,406 shares were issued to employees of the company and its affiliates out of conditional capital in 2018 (in 2017 in connection with the exercise of stock options 236,615 shares). The par value of EUR 195 thousand (prior year: EUR 237 thousand) was appropriated to share capital, whereas the premium resulting from the exercise of stock options of EUR 615 thousand (prior year: EUR 793 thousand) was recognized within capital reserve.

Other information on the share option programs is included in note (38).

Authorized capital

According to the company's articles of association, the management board is authorized, subject to the consent of the supervisory board, to increase subscribed capital until May 19, 2020, only once or in successive tranches by a maximum of EUR 24,048 thousand by issuing new common shares in return for cash or non-cash contributions (conditional capital 2015/I). Subject to the consent of the supervisory board, the management board is further authorized to decide whether to exclude stockholders' subscription rights. Stockholders' subscription rights can be excluded for capital increases for cash contributions as well as contributions in kind if during the term of this authorization and in exclusion of shareholder subscription rights, the shares issued against contributions in cash or in kind do not exceed 20% of the share capital.

Conditional capital

The annual shareholder´s meeting on June 13, 2018, resolved to liquidation of the conditional capital 2003/2008. In addition, the conditional capital 2011/I has been increased by EUR 472 thousand to EUR 4,973 thousand. The resolutions were registered in the commercial register on June 21, 2018.

Considering the above described capital transactions, the total conditional capital on December 31, 2018 amounts to EUR 4,778 thousand.

The changes in share capital, authorized and conditional capital are summarized below:

(in thousands of EUR)	Share capital	Authorized capital 2015/I	Conditional capital 2003/2008	Conditional capital 2011/I
Jan. 1, 2018	49,736	24,048	75	4,501
Changes due to Annual Shareholders' Meeting resolutions	-	-	-75	472
Stock options exercised	195	-	-	-195
Dec. 31, 2018	49,931	24,048	-	4,778

Capital reserve
The capital reserve includes premium payments from the issuance of shares, as well as additional contributions to the company's equity associated with the exercise of stock options. Additionally, the capital reserve contains the correspondent accumulated compensation expenses related to stock option rights issued amounting to EUR 20,894 thousand (prior year: EUR 19,456 thousand).

Accumulated other comprehensive income/ (loss)
Accumulated other comprehensive income/ (loss) is used to record exchange differences arising from the translation of the financial statements of foreign operations. In addition, the result from remeasurement of defined benefit obligations is included in this line item.

The tax effect related to components of other comprehensive income/ (loss) is as follows:

(in thousands of EUR)	2018		
	pre-tax	tax effect	after tax
Remeasurement of defined benefit obligations	-2,072	79	-1,993
	-2,072	79	-1,993

(in thousands of EUR)	2017		
	pre-tax	tax effect	after tax
Remeasurement of defined benefit obligations	-2,418	118	-2,300
	-2,418	118	-2,300

Changes in stockholders' equity are summarized in the consolidated statement of changes in stockholders' equity.

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Voting Rights
According to section 33 paragraph 1 and 2, section 38 paragraph 1 and section 40 of the German Securities Trading Law (Wertpapier-Handelsgesetz, WpHG) the company published the following information on the ADVA Optical Networking homepage in 2018:

Date of change in investment	Name of investment owner	Threshold limit	Share of voting rights
Nov. 28, 2018	Duke University, Durham, North Carolina, USA	above 3%	3.01%
Oct. 10, 2018	Internationale Kapitalanlagegesellschaft mit beschränkter Haftung, Düsseldorf, Germany	below 5%	4.94%
Oct. 1, 2018	DNB Asset Management AS, Oslo, Norway	above 3%	3.01%
Sep. 19, 2018	Teleios Capital Partners LLC, Zug, Switzerland	above 20%	20.25%
Sep. 3, 2018	Teleios Capital Partners LLC, Zug, Switzerland	above 15%	15.57%
Jul. 31, 2018	Morgan Stanley, Wilmington, Delaware, USA	above 3%	3.76%
Jul. 18, 2018	Internationale Kapitalanlagegesellschaft mit beschränkter Haftung, Düsseldorf, Germany	above 5%	6.04%
May 24, 2018	Morgan Stanley, Wilmington, Delaware, USA	below 5%	3.54%
May 23, 2018	Morgan Stanley, Wilmington, Delaware, USA	above 5%	5.06%
May 22, 2018	Internationale Kapitalanlagegesellschaft mit beschränkter Haftung, Düsseldorf, Germany	above 5%	6.01%
Apr. 18, 2018	Internationale Kapitalanlagegesellschaft mit beschränkter Haftung, Düsseldorf, Germany	above 5%	5.01%
March 27, 2018	Morgan Stanley, Wilmington, Delaware, USA	below 5%	4.10%
March 26, 2018	Morgan Stanley, Wilmington, Delaware, USA	above 3%; above 5%	9.13%
March 15, 2018	Internationale Kapitalanlagegesellschaft mit beschränkter Haftung, Düsseldorf, Germany	below 5%	4.90%
March 7, 2018	Teleios Capital Partners LLC, Zug, Switzerland	above 10%	10.01%
Dec. 11, 2017	Deutsche Bank AG, Frankfurt am Main, Germany	below 3%	0.00%
Nov. 30, 2017	EGORA Holding GmbH, Planegg, Germany	below 15%	14.99%
Nov. 23, 2017	Internationale Kapitalanlagegesellschaft mit beschränkter Haftung, Düsseldorf, Germany	above 5%	5.13%
Nov. 15, 2017	Teleios Capital Partners LLC, Zug, Switzerland	above 15%	15.03%
Sep. 27, 2017	Duke University, Durham, USA	above 3%	3.01%
Jul. 28, 2017	The Goldman Sachs Group, Inc., New York, USA	above 3%	4.39%
May 23, 2017	Dimensional Holdings Inc., Oviedo, USA	above 3%	3.01%
May 2, 2017	Ministry of Finance on behalf of the State of Norway, Oslo, Norway	above 3%	3.19%
Feb. 20, 2017	Deutsche Asset Management Investment GmbH, Frankfurt, Germany	below 3%	2.95%
Jan. 11, 2016	Morgan Stanley, Wilmington, Delaware, USA	below 3%	1.63%

Notes to the consolidated income statement

(22) Revenues

In 2018 and 2017, revenues included EUR 64,323 thousand and EUR 57,734 thousand for services, respectively. The remaining revenues relate mainly to product sales.

In 2018, revenues related to service level agreements amounting to EUR 15,833 thousand and revenues related to customer loyalty programs amounting to EUR 142 thousand have been recognized. These were included in contract liabilities at the beginning of the period.

In 2018, revenues amounted to EUR 452,267 thousand relate to performance obligations that were performed at a specific point in time, and revenues of EUR 49,714 thousand relate to performance obligations that were delivered over a period of time.

A segmentation of revenues by geographic region is provided in the section on segment reporting under note (31).

(23) Other operating income and expenses

Other operating income and expenses analyze as follows:

(in thousands of EUR)	2018	2017
Other operating income		
Government grants received	2,222	2,083
Income for the supply of development services	195	755
Release of bad debt allowances	67	596
Release of provisions	4,291	1,423
Other	2,174	2,102
	8,949	6,959
Other operating expenses		
Impairments on trade accounts receivable	-80	-118
Other	-427	-472
	-507	-590
Other operating income and expenses, net	8,442	6,369

(24) Interest income and expenses

Interest income primarily includes interest from daily bank deposits and from other short-term deposits with maturities between one day and three months.

Interest expenses are primarily incurred on financial liabilities and on the sale of receivables. In addition, net interest expenses from valuation of defined benefit plans are included. For further details, refer to notes (11), (16), (18) and (32).

(25) Other financial gains and losses, net

Other financial gains and losses, net, comprise the following:

(in thousands of EUR)	2018	2017
Foreign currency exchange gains	12,405	7,365
thereof: gains from forward rate agreements	*675*	*81*
Foreign currency exchange losses	-13,882	-11,174
thereof: losses from forward rate agreements	*-289*	*-1,976*
Income from investments available for sale	381	-
	-1,096	-3,809

Further information on the foreign currency derivatives is contained in note (32).

(26) Income taxes

Income taxes in Germany consist of corporate income tax, the solidarity surcharge and trade taxes. The tax calculation in foreign countries is based on the applicable local tax rates. They vary between 15% and 31% (prior year: between 15% and 37%).

The table below shows the components of the group's total income tax expenses:

(in thousands of EUR)	2018	2017
Current taxes		
Current income tax charge	-1,180	-1,724
Adjustments in respect of current income tax for prior years	88	220
	-1,092	-1,504
Deferred taxes		
Temporary differences and tax loss carry-forwards	-1,700	-938
Changes in tax rates	-15	-1,595
	-1,715	-2,533
Income tax benefit (expense), net	-2,807	-4,037

A reconciliation of income taxes based on the accounting profit/ (loss) and the expected domestic income tax rate for the parent company of 28.57% (prior year: 28.53%) to effective income tax (expense) benefit, net, is presented below:

(in thousands of EUR)	2018	2017
Accounting income / (loss) before tax	12,485	-191
Expected statutory tax (benefit/(expense)	-3,567	55
Tax rate adjustments	-15	-1,595
Tax for prior periods	88	220
Foreign tax rate differential	782	-583
Non-tax-deductible stock option expenses	-411	-146
Differences from foreign branch offices	-147	-61
Non-taxable income and other non-tax-deductible expenses	137	-442
Other adjustments to recognition of deferred tax assets	-	-730
Permanent differences	229	153
Not capitalized deferred tax assets for tax losses	142	-1,305
Other differences	-45	397
Income tax expense (benefit), net	-2,807	-4,037
Effective tax rate	-22.49%	2,113.61%

Compared to the prior year, where the income effect resulting from the tax rate changes and relating mainly to ADVA Optical Networking North America, MRV Communications Inc. and MRV Communications Americas Inc. amounted to a total of EUR 1,595 thousand, in the current year this effect totaling to EUR 15 thousand is low and relates mainly to the changes in the local tax rate of ADVA Optical Networking SE (prior year: nil).

The not capitalized deferred tax assets for tax losses are mainly related to ADVA Optical Networking SE in the amount of EUR 3,537 thousand (prior year: EUR 3,035 thousand) and ADVA Optical Networking North America amounting to negative EUR 1,630 thousand (prior year: negative EUR 2,263 thousand).

The deferred tax assets and deferred tax liabilities on December 31, 2018 and 2017 relate to the following:

	2018		2017	
(in thousands of EUR)	Deferred tax assets	Deferred tax liabilities	Deferred tax assets	Deferred tax liabilities
Current assets				
Cash and cash equivalents	1	-	1	-
Trade accounts receivable	8	-5	104	-16
Inventories	2,101	-1,546	2,618	-1,482
Other current assets	-	-172	-	-5
Total current assets	**2,110**	**-1,723**	**2,723**	**-1,503**
Non-current assets				
Leasing of assets	-	-	-	-
Property, plant and equipment	156	-89	204	-1,028
Goodwill	-	-2,636	-	-4,561
Capitalized development projects	-	-25,788	-	-24,900
Intangible assets acquired in business combinations	1,610	-3,715	2,004	-6,058
Other intangible assets	-	-3	-	-104
Other non-current assets	678	-402	661	-
Total non-current assets	**2,444**	**-32,633**	**2,869**	**-36,651**

	2018		2017	
(in thousands of EUR)	Deferred tax assets	Deferred tax liabilities	Deferred tax assets	Deferred tax liabilities
Current liabilities				
Trade accounts payable	289	-46	3	-154
Provisions	2,382	-	1,093	-
Deferred revenues	1,271	-	724	-
Other current liabilities	422	-	1,059	-
Total current liabilities	**4,364**	**-46**	**2,879**	**-154**
Non-current liabilities				
Other non-current liabilities	1,121	-	1,576	-
Total non-current liabilities	**1,121**	**-**	**1,576**	**-**
Tax loss carry-forwards				
German tax loss carry-forwards	17,776	-	16,748	-
thereof: current	-	-	-	-
thereof: non-current	*17,776*	-	*16,748*	-
Foreign tax loss carry-forwards	3,074	-	9,625	-
thereof: current	*3,074*	-	*7,977*	-
thereof: non-current	-	-	*1,648*	-
Total tax loss carry-forwards	**20,850**	**-**	**26,373**	**-**
Total deferred tax assets/(liabilities)	**30,889**	**-34.402**	**36,420**	**-38,308**
thereof: current	*9,548*	*-1,769*	*13,579*	*-1,657*
thereof: non-current	*21,341*	*-32,633*	*22,841*	*-36,651*
Netting	-23,574	23,574	-25,806	25,806
Deferred tax net	**7,315**	**-10,828**	**10,614**	**-12,502**

Temporary differences are differences between the carrying amount of an asset or liability in the balance sheet according to IFRS and its tax base.

Deferred tax assets have been recognized for German and foreign tax loss carry-forwards since net deferred tax liabilities arising from temporary differences as well as a positive tax planning, which are relevant for the recognition of tax loss carry-forwards as reported, exists.

The German and foreign tax loss carry-forwards on December 31 comprise as follows:

(in thousands of EUR)	2018	2017
ADVA Optical Networking SE	165,090	148,086
ADVA Optical Networking North America	94,807	106,005
OSA Switzerland	15,667	15,049
ADVA Optical Networking Israel	622	3,831
ADVA NA Holdings	58	56
ADVA IT Solutions	11	9
	276,255	273,036

Deferred tax assets have been recognized in respect of tax losses in the ADVA Optical Networking SE amounting to EUR 62,202 thousand (prior year: EUR 58,692 thousand) due to a reasonable assurance that taxable profits will be recognized in the near future that can be offset against tax loss carry-forwards.

ADVA Optical Networking North America reports further tax income over an aggregated four-year-period and taking into account the following restrictions there is a reasonable assurance that taxable profits will be recognized in the near future that can be offset against tax loss carry-forwards.

Pursuant to the U.S. Tax Act, federal tax loss carry-forwards in the U.S. expire after twenty years. Furthermore, the utilization of a portion of tax loss carry-forwards is subject to annual limitations. Consequently, deferred tax assets have not been recognized in respect of tax loss carry-forwards in ADVA Optical Networking North America in the amount of EUR 82,513 thousand (prior year: EUR 85,228 thousand).

Furthermore, deferred tax assets for tax loss carry-forwards for state and local purposes expire in between five and twenty years. Deferred tax assets in respect of these tax loss carry-forwards have been recognized in the amount of EUR 354 thousand (prior year: nil).

Whether or not deferred tax assets are realized depends on the generation of future taxable income during periods in which these temporary differences are deductible. The group has considered the scheduled reversal of deferred tax liabilities and projected future taxable income in making this assessment.

On December 31, 2018 and 2017, no deferred tax liabilities on retained earnings of group companies have been recognized. ADVA Optical Networking committed that there will be no distribution of currently undistributed earnings from the company's major subsidiaries in the near future. The amount of temporary differences for which no deferred tax liabilities have been recognized totals to EUR 15,815 thousand (prior year: EUR 11,872 thousand).

Deferred tax assets for pensions and similar employee benefits in the amount of EUR 79 thousand are recognized in accumulated other comprehensive loss (prior year: EUR 118 thousand).

(27) Employees and personnel expenses

In 2018 and 2017, respectively, the ADVA Optical Networking group had an average of 1,831 and 1,834 permanent employees and an average of 26 and 24 apprentices on its payroll, respectively in the following departments:

	2018	2017
Purchasing and Operations	379	381
Sales and Marketing	343	338
General and Administration	164	164
Research and Development	945	951
Apprentices	26	24
	1,857	1,858

Furthermore, ADVA Optical Networking employs 24 and 19 people on a temporary basis effective December 31, 2018 and 2017, respectively.

Personnel expenses for 2018 and 2017 totaled EUR 173,024 thousand and EUR 171,607 thousand, respectively:

(in thousands of EUR)	2018	2017
Wages and salaries	144,231	143,263
Social security costs	21,398	25,095
Expenses for post-employment benefits	5,982	1,990
Share-based compensation expenses	1,413	1,259
	173,024	171,607

Expenses for retirement benefits include expenses related to defined contribution plans as well as service costs for defined obligation plans.

Further details on expenses for post-employment benefits are included in note (18).

Details regarding share-based compensation expenses are shown in note (38).

(28) Restructuring expenses

In 2018, restructuring expenses including severance payments as well as related legal costs amounting to EUR 1,338 thousand have been recognized (2017: EUR 9,434 thousand including in addition amortization of capitalized development projects and expenses related to changed use of facilities). The allocation to functional areas in the consolidated income statement is included in note (31).

Other disclosures

(29) Consolidated cash flow statement

The consolidated cash flow statement has been prepared in accordance with IAS 7.

Cash and cash equivalents include short-term cash and short-term financial assets whose original remaining maturity does not exceed three months. Bank overdrafts are reported in financial liabilities.

Cash flows from investing and financing activities are determined directly, whereas the cash flow from operating activities is derived indirectly from the consolidated income before tax. When cash flow from operating activities is calculated, the changes in assets and liabilities are adjusted for the effects of currency translation. As a result, it is not possible to reconcile the figures to the differences in the published consolidated statement of financial position.

The decrease of financial liabilities from EUR 96,561 thousand to EUR 89,484 thousand relates to cash outflows from financing activities amounting to EUR 7,083 thousand. Non-cash effects from the effective interest method amount to positive EUR 6 thousand and are reported in cash flow from operating activities. Furthermore, actual interest payments amounting to EUR 1,953 thousand are included in cash flow from financing activities.

Cash and cash equivalents to which the group only has restricted access are explained in note (10).

(30) Earnings per share

In accordance with IAS 33, basic earnings per share are calculated by dividing consolidated net income by the weighted average number of shares outstanding.

There were no material dilution effects in the current fiscal year. Diluted earnings per share are calculated by adjusting the weighted average number of shares outstanding by the number of potential shares arising from granted and exercisable stock options on the balance sheet date.

No effects of dilution had to be considered in net income in 2018 and 2017.

The following table reflects the number of shares used in the computation of basic and diluted earnings per share:

	2018	2017
Weighted average number of shares (basic)	49,810,321	49,607,289
Effect of dilution from stock options	423,895	570,190
Weighted average number of shares (diluted)	50,234,216	50,177,479

There have been no other material transactions involving ordinary shares or potential shares between the balance sheet date and the date of authorization for issue of these financial statements.

(31) Segment reporting

In accordance with IFRS 8, operating segments are identified based on the way information is reported internally to the chief operating decision maker, i.e. the management board, and regularly reviewed to make decisions about resources to be assigned to the segment and assess its performance. The internal organizational and management structure and the structure of internal financial reporting activities are the key factors in determining what information is reported. For making decisions about resource allocation and performance assessment, management does not monitor the operating results separately on the level of business units.

Within the ADVA Optical Networking group, management decisions are based on pro forma operating income. Pro forma financial information excludes non-cash charges related to share-based compensation plans and amortization and impairment of goodwill and acquisition-related intangible assets. Additionally, from 2017 onwards expenses related to restructuring measures are not included. Income from capitalization of development expenses is shown as a separate line item and not deducted from research and development expenses.

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Segment information on December 31, 2018 presents as follows:

(in thousands of EUR)	Pro forma financial information	Intangible assets from acquisitions	Goodwill	Compen-sation expenses	Restruc-turing expenses	Disclosure of R&D expenses	Consolidated financial information
Revenues	501,981	-	-	-	-	-	501,981
Cost of goods sold	-316,360	-3,536	-	-58	-299	-	-320,253
Gross profit	185,621	-3,536	-	-58	-299	-	181,728
Gross margin	37.0%						36.2%
Selling and marketing expenses	-61,010	-1,990	-	-438	-131	-	-63,569
General and administrative expenses	-34,494	-	-	-346	-184	-	-35,024
Research and development expenses	-107,165	-	-	-571	-724	31,872	-76,588
Income from capitalization of development expenses	31,872	-	-	-	-	-31,872	-
Other operating income	8,949	-	-	-	-	-	8,949
Other operating expenses	-507	-	-	-	-	-	-507
Operating income	23,266	-5,526	-	-1,413	-1,338	-	14,989
Operating margin	4.6%						3.0%
Segment assets	390,126	26,012	70,400	-	-	-	486.538

Segment information on December 31, 2017 presents as follows:

(in thousands of EUR)	Pro forma financial information	Intangible assets from acquisitions	Goodwill	Compen-sation expenses	Restruc-turing expenses	Disclosure of R&D expenses	Consolidated financial information
Revenues	514,471	-	-	-	-	-	514,471
Cost of goods sold	-340,093	-3,165	-	-18	-4,975	-	-348,251
Gross profit	174,378	-3,165	-	-18	-4,975	-	166,220
Gross margin	33.9%						32.3%
Selling and marketing expenses	-60,513	-1,262	-	-183	-931	-	-62,889
General and administrative expenses	-33,998	-	-	-646	-1,616	-	-36,260
Research and development expenses	-105,746	-	-	-412	-1,912	39,033	-69,037
Income from capitalization of development expenses	39,033	-	-	-	-	-39,033	-
Other operating income	6,959	-	-	-	-	-	6,959
Other operating expenses	-590	-	-	-	-	-	-590
Operating income	19,523	-4,427	-	-1,259	-9,434	-	4,403
Operating margin	3.8%						0.9%
Segment assets	365,347	30,305	68,036	-	-	-	463,888

Additional information by geographical regions:

(in thousands of EUR)	2018	2017
Revenues		
Germany	113,082	107,581
Rest of Europe, Middle East and Africa	136,109	150,166
Americas	192,087	224,362
Asia-Pacific	60,703	32,362
	501,981	514,471

(in thousands of EUR)	Dec. 31, 2018	Dec. 31, 2017
Non-current assets		
Germany	114,393	113,186
Rest of Europe, Middle East and Africa	15,642	16,221
Americas	86,586	85,433
Asia-Pacific	2,281	2,185
	218,902	217,025

Revenue information is based on the shipment location of the customers.

In 2018, revenues with no major customer exceeded 10% of total revenues (2017: revenues with three major customers). In 2017, the share of revenues allocated to major customers was EUR 162,454 thousand; thereof revenue with the biggest customer was EUR 54,278 thousand, with the second biggest customer EUR 54,229 thousand and the third biggest customer EUR 53,947 thousand.

Non-current assets including property, plant and equipment, intangible assets and finance lease equipment are attributed based on the location of the respective group company.

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(32) Financial instruments

The following tables analyze carrying amounts and fair values according to valuation categories. Only assets and liabilities, which fall into the categories defined by IFRS 7, are presented, so that the total amounts disclosed do not correspond to the balance sheet totals of each year.

			Amounts recognized according to IFRS 9			
(in thousands of EUR, on Dec. 31, 2018)	Valuation category in accordance with IFRS 9	Carrying amount	Amortized cost	Fair value recognized in profit and loss	Fair value	Hierarchy of fair values
Assets						
Cash and cash equivalents	AC	62,619	62,619	-	n/a*	n/a*
Trade accounts receivable without underlying factoring contract	AC	95,053	95,053	-	n/a*	n/a*
Trade accounts receivable with underlying factoring contract	FVTPL FK	4,251	-	4,251	4,251	Level 2
Other current financial assets	AC	2,883	2,883	-	n/a*	n/a*
Other non-current financial assets	AC	1,731	1,731	-	1,731	Level 2
Derivatives without a hedging relationship	FVTPL	108	-	108	108	Level 2
Investments	FVTPL	1,767	-	1,767	1,767	Level 3
Total financial assets		**168,412**	**162,286**	**6,126**	**7,857**	
Liabilities						
Current financial liabilities (bank loans)	AC	19,400	19,400	-	19,372	Level 2
Non-current financial liabilities (bank loans)	AC	70,084	70,084	-	70,628	Level 2
Trade accounts payable	AC	63,195	63,195	-	n/a*	n/a*
Other current financial liabilities	AC	18,098	18,098	-	n/a*	n/a*
Other non-current financial liabilities	AC	62	62	-	62	Level 2
Total financial liabilities		**170,839**	**170,839**	**-**	**90,062**	

*Due to the short-term nature, it was assumed that the book value as of the reporting date approximates the fair value.

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(in thousands of EUR, on Dec. 31, 2017)	Valuation category in accordance with IAS 39	Carrying amount	Amounts recognized according to IAS 39			
			Amortized cost	Fair value recognized in profit and loss	Fair value	Hierarchy
Assets						
Cash and cash equivalents	LaR	58,376	58,376	-	58,376	Level 2
Trade accounts receivable	LaR	81,327	81,327	-	81,327	Level 2
Other current and non-current financial assets	LaR	7,507	7,507	-	7,507	Level 2
Derivatives without a hedging relationship	FVTPL	12	-	12	12	Level 2
Investments	AfS	1,374	1,374	-	1,374	Level 2
Total financial assets		**148,596**	**148,584**	**12**	**148,596**	
Liabilities						
Current and non-current financial liabilities (bank loans)	FLAC	96,561	96,561	-	97,007	Level 2
Trade accounts payable	FLAC	39,193	39,193	-	39,193	Level 2
Other current and non-current financial liabilities	FLAC	17,014	17,014	-	17,014	Level 2
Total financial liabilities		**152,768**	**152,768**	**-**	**153,214**	
Of which aggregated by category in accordance with IAS 39:						
Loans and receivables (LaR)		145,824	145,824	-	145,824	
Financial assets at fair value through profit or loss (FVTPL)		12	-	12	12	
Financial assets available for sale (AfS)		1,374	1,374	-	1,374	
Financial liabilities at amortized cost (FLAC)		152,768	152,768	-	153,214	

The group uses the following hierarchy for determining the fair value of financial instruments:

Level 1: Quoted prices in active markets for identical assets or liabilities.

Level 2: Techniques for which all inputs that have a significant effect on the recorded fair value are observable, either directly or indirectly.

Level 3: Techniques, which use inputs that are not based on observable market data.

The measurement of the assets and liabilities at fair value through profit or loss is based on fair values of Level 2 and Level 3. As of December 31, 2017, only Level 2 valuations have been applied. In 2018 and 2017, no transfers between hierarchy levels occurred.

In the case of cash and cash equivalents, current trade receivables valued at amortized cost, other current financial assets and liabilities as well as trade accounts payable, the carrying amounts represent reasonable approximations for the fair values.

Forward rate agreements are measured using quoted forward exchange rates and yield curves derived from quoted interest rates according to the maturities of the contract.

Investments relate to equity instruments of Saguna Networks Ltd. with no quoted prices in active markets. Input factors for the valuation are share prices from past investment rounds and current purchase price offers from other investors in Saguna Networks Ltd.

The fair values of financial liabilities as well as other non-current financial assets and liabilities have been calculated based on future cash flows by using arm's length interest rates.

The fair value of the balance sheet items valued at Level 3 on December 31, 2018 was EUR 1,767 thousand (December 31, 2017: EUR 1,374 thousand). The change in value in the current financial year resulted in particular from an investment available for sale, which was completely written off in the previous year.

The following table shows the net results per valuation category according to IFRS 9:

(in thousands of EUR)	Note	2018
Financial assets measured at amortized cost	(14)	323
Financial liabilities measured at amortized cost	(16)	-1,751
Financial assets and liabilities measured at fair value through profit or loss	(32)	477
Net result		**-951**

The net result from financial assets measured at amortized cost includes the impairment loss recognized in the current period and the derecognition expense on the relevant assets. Net results of financial instruments at fair value through profit or loss consist of changes in the fair value of derivative financial instruments, trade receivables subject to factoring agreements and equity investments.

Interest income and expenses from financial assets and liabilities are as follows:

(in thousands of EUR)	Note	2018
Financial assets measured at amortized cost		
Total interest income	(24)	219
Financial liabilities measured at amortized cost		
Total interest expense	(24)	-1,774

In 2017, gains and losses and interest income and expenses from financial instruments were as follows:

(in thousands of EUR)	Note	2017
Gains and losses		
Financial assets and liabilities at fair value through profit or loss	(25)	-1,895
Loans and receivables	(11, 24)	-337
Interest income and expenses	(24)	
Interest income from loans and receivables		186
Interest expense related to financial liabilities measured at amortized cost		-1,297

As the necessary prerequisites have not been fulfilled, no financial assets and liabilities are offset in the balance sheet. Master netting agreements exist with the contractual partners of the derivatives, according to which a set-off can be made in the event of insolvency. As of the balance sheet date, there were only insignificant offsetting potentials from derivative financial instruments.

(33) Financial risk management

The following section describes the group's position with regard to risks arising from financial instruments and their potential future impact on the net assets, financial position and operational results. The classification into material and immaterial financial risks considered in the risk report has been disregarded.

Goals, guidelines and processes of the group's risk management system are discussed in detail in the risk report within the management report. ADVA Optical Networking's capital management is described in note (34).

The management board establishes principles for overall risk management and decides on the use of derivative financial instruments and the investment of excess liquidity. The compliance department is responsible for group-wide monitoring of observance of the processes and guidelines of the risk management system defined by the ADVA Optical Networking management board.

Foreign currency risks

Risk exposure

ADVA Optical Networking is exposed to foreign currency risks as investments, financing and operations are carried out in several currencies. This results in foreign currency risks from future transactions as well as from recognized assets and liabilities denominated in a currency other than the functional currency of the respective group company. As part of the reporting date analysis of balance sheet exposures and exchange rate sensitivities, the currency pairs EUR/USD, EUR/CHF, SGD/USD and ILS/USD were identified as relevant.

The foreign currency risk of ADVA on the basis of the underlying transactions at the end of 2018 in the major currencies is as follows:

(in thousands, on Dec. 31)	USD	CHF
Trade accounts receivable	9,049	4
Trade accounts payable	34,141	11

Risk management

ADVA Optical Networking's risk management framework considers operational business risks to the business that affect the income statement. Specific hedging transactions are only concluded if larger non-recurring foreign exchange risks are expected (e.g. due to a planned M&A transaction). Regarding intercompany payments, the treasury department is closely involved in order to optimize the cash flows with regard to currencies and separate hedging considerations. Foreign currency risks from recognized financial assets and liabilities are only considered by ADVA Optical Networking's risk management in specific cases.

In 2018, the group recorded significant external net cash inflows in GBP and significant external net cash outflows in USD. In order to mitigate these material operational risks and as a means to offset cash-flow fluctuations, ADVA Optical Networking's Treasury Department has been hedging some of its net cash flows in USD versus GBP through the use of forward foreign exchange agreements in GBP already in 2017. These transactions became due in the current year and resulted in a net loss of EUR 239 thousand.

To hedge exchange rate risks from future cash flows, the group entered into derivatives that will mature in the first quarter of 2019. The fair value of these foreign exchange agreements is recognized in other current assets or other current liabilities. The related fair values amounted to positive EUR 108 thousand in total (December 31, 2017: positive EUR 12 thousand). As of December 31, 2018, the nominal value of these derivatives amounted to EUR 8,786 thousand (December 31, 2017: EUR 15,108 thousand). The nominal value is the accounting value from which payments are derived. Since the nominal value itself is not at risk, the potential for changes in foreign currency exchange rates is hedged.

Sensitivity analysis

The foreign exchange rate sensitivity of the most relevant currency pairs with respect to balance sheet risks on earnings after tax at the end of the reporting period is illustrated below. The analysis does not take into account effects from the translation of the financial statements of the group's foreign subsidiaries into EUR the company's reporting currency.

If, at the balance sheet date, the relevant exchange rates would have appreciated or depreciated by 10% relative to the base currency in the relevant currency relations (base currency/spot currency), the following impact on earnings after tax would have to be considered:

(in thousands of EUR, on December 31)	2018	
	+10%	-10%
EUR/CHF	-1,668	2,039
EUR/USD	-1,165	1,424
USD/SGD	-508	621
USD/ILS	463	-566

In addition, the currency pair USD/GBP is relevant for risk management considerations. If, at the balance sheet date, the spot currency GBP had appreciated or depreciated by 10% against the base currency USD, the following effects would have been recognized in profit or loss:

(in thousands of EUR, on December 31)	2018	
	GBP +10%	GBP -10%
USD/GBP	980	-792

Interest rate risk

Risk exposure

The interest rate risk is the risk that fair values or future interest payments on existing and future financial liabilities will fluctuate due to changes in market interest rates.

In addition to medium and long-term financial instruments with fixed interest rates, ADVA Optical Networking SE has a variable-rate loan of EUR 65 thousand to finance its investments, which fundamentally results in an interest rate risk. Additionally, there is an outstanding credit line of EUR 10 thousand which has not been drawn as of December 31, 2018. The interest on a loan drawn under this credit line would depend on EURIBOR. Further information on existing financial liabilities can be found in note (16).

Risk management

The treasury department regularly analyzes the existing interest rate risk and, in the event of a material risk, makes proposals for the use of appropriate hedging instruments. As part of risk management to limit interest rate risks, derivative financial instruments such as interest rate caps and interest rate swaps can be used. Due to the continued expansive interest rate policy of the European Central Bank, the EURIBOR interest rate is negative at the reporting date. Due to low economic forecasts and low core inflation, ADVA does not expect any significant interest rate spreads change in the euro area and thus rates the interest rate risk as low as at December 31, 2018.

Sensitivity analysis

The interest rate sensitivity of the result after taxes is shown below. At the reporting date, financial instruments having a potential effect on equity did not exist. As of December 31, 2018, the 3-month EURIBOR was at negative -0.309%. Due to the floor agreed in the loan agreement, a reduction in EURIBOR as at December 31, 2018 would have had no effect on the interest rate. An EURIBOR increase of 0.5% would have resulted in an additional interest expense of EUR 27 thousand. At year-end 2017, there were no financial instruments that could have had an effect on profit after tax or equity. Therefore, no sensitivity analysis was carried out for the 2017 financial year.

Default risk

Risk exposure

The default risk arising from financial assets involves the risk of the default of a contractual partner and thus includes at maximum the amount of the related recognized carrying amounts. At ADVA Optical Networking default risks arise from cash at banks, contract assets and contractual cash flows from debt instruments that are measured at amortized cost or at fair value through profit or loss, including outstanding trade receivables.

Risk management

All default risks are managed at group level. The default risk is mitigated by various measures, depending on the class of financial assets. In addition, the credit risk from non-derivative financial assets is taken into account by means of risk provisioning and bad debt allowances.

ADVA Optical Networking enters into transactions with creditworthy banks and financial institutions. To assess the creditworthiness of banks and financial institutions, ADVA uses current credit ratings from rating agencies (S&P, Moody's or Fitch) as well as current default rates (credit default swaps). Based on the capital market ratings, ADVA divided the banks into three internal rating classes, determining their exposure at default and calculating the expected loss at default as of December 31, 2018. Due to immateriality, no risk provisions were recognized at the balance sheet date.

(in thousands of EUR)	Gross carrying amount (risk exposure)
Rating class 1	62,608
Rating class 2	12
Rating class 3	32
Total	62,652

ADVA Optical Networking has distributed its investments to more than 10 international credit institutions. As of December 31, 2018, one bank was responsible for approximately 75% of all investments. This results in a maximum risk of EUR 46,906 thousand. Due to immateriality, no risk provisions were recognized at the balance sheet date.

When concluding contracts with clients, the creditworthiness and credit quality of the client is assessed on the basis of independent ratings (e.g. Duns & Bradstreet), audited financial statements, or historical experience. Depending on the risk assessment, deliveries are made solely only under reasonable payment terms, which may include down payments or advance payments.

The group uses the simplified approach under IFRS 9 to measure the expected credit losses on trade receivables and contract assets. Trade receivables are summarized on the basis of common credit risk characteristics and overdue days.

As of December 31, 2018, the expected loss ratios are based on historical payment profiles of receivables and the corresponding historical defaults. There are adjusted to reflect up-to-date and forward-looking information on macroeconomic factors (such as geopolitical events, currency fluctuations, inflation, trade wars, state subsidies) that may affect clients' solvency. Contract assets relate to work that has not yet been invoiced, and accordingly have the same risk characteristics as trade receivables of the underlying contracts.

The following table shows the gross carrying amounts of trade accounts receivable and contract assets by maturity as of December 31, 2018 (simplified approach):

(in thousands of EUR)	Not yet due	Overdue up to 90 days	90 - 180 days overdue	180 days to 1 year overdue	more than 1 year overdue	high default risk	Total
Trade accounts receivable	82,344	14,363	415	882	570	-	98,574
Contract assets	320	-	-	-	-	-	320

Due to immateriality, no valuation allowances were recognized relating to contract assets as of December 31, 2018. The reconciliation of risk provisions for trade receivables is shown in note (11).

For other financial assets carried at amortized cost with a total carrying amount of EUR 4,614 thousand, the group analyzes the risk on a case-by-case basis. As of December 31, 2018, there were no significant default risks. Therefore, no valuation allowances were recognized.

Liquidity risk

Risk exposure

In general, the inability to meet its financial obligations, such as servicing its debts, composes the liquidity risk of ADVA Optical Networking.

Risk management

Management uses rolling forecasts to monitor the group's liquidity reserves, consisting of cash and cash equivalents based on expected cash flows and unused credit lines. To manage liquidity, ADVA Optical Networking considers compliance with internally defined operating liquidity at all times.

The group's liquidity management policies include the forecast of cash flows in the major currencies and the assessment of required cash in these currencies, the monitoring of balance sheet liquidity ratios and the management of debt financing plans. In general, ADVA Optical Networking pursues a conservative and risk-avoiding strategy.

The loan agreements contain restrictions and covenants that restrict the financial and operating scope of ADVA Optical Networking. A breach of these agreements would result in a compulsory early repayment of the loans. The company estimates this risk as low as at the reporting date.

Financing agreements
At the end of the reporting period, the Group had unused credit lines in the amount of EUR 10,000 thousand available.

Maturities of financial liabilities
The table below analyzes the group's non-derivative financial liabilities according to their maturity based on the remaining time at the balance sheet date to the contractual maturity date:

(in thousands of EUR, on Dec. 31, 2018)			Future cash flows					
			≤ 12 months		13 – 36 months		> 36 months	
	Note	Carrying value	Redemption	Interest	Redemption	Interest	Redemption	Interest
Financial liabilities	(16)	89,484	19,400	1,291	34,205	1,818	35,879	836
Trade accounts payable and other financial liabilities	(17)	81,355	81,293	-	62	-	-	-
		170,839	100,693	1,291	34,267	1,818	35,879	836

(in thousands of EUR, on Dec. 31, 2017)			Future cash flows					
			≤ 12 months		13 – 36 months		> 36 months	
	Note	Carrying value	Redemption	Interest	Redemption	Interest	Redemption	Interest
Financial liabilities	(16)	96,561	79,061	492	17,500	394	-	-
Trade accounts payable and other financial liabilities	(17)	56,207	55,261	-	946	-	-	-
		152,768	134,322	492	18,446	394	-	-

(34) Capital management

Risk management
ADVA Optical Networking's capital management aims to ensure the continued existence of the company and optimization of its capital structure to reduce its cost of capital.

The group defines capital as the sum of equity and financial liabilities. Equity at December 31, 2018 amounted to EUR 244,641 thousand or 50.3% of the balance sheet total (previous year: EUR 227,021 thousand or 48.9% of the balance sheet total). For financial liabilities of EUR 89,484 thousand as of December 31, 2018 (previous year: EUR 96,561 thousand), the term usually exceeds the life of the assets financed. ADVA Optical Networking aims for an equity ratio of at least 30% and a ratio of gross debt to EBITDA of a maximum of 2.5 x. Both financial ratios were met in the past financial year.

Financial covenants
The loan agreements include compliance with certain financial covenants that should be guaranteed at all times within the scope of capital management. The commitment clauses refer to the following key measures:

- Proportion of effective debt to cash flow for the last 12 months
- Proportion of gross debt to EBITDA for the last 12 months
- Proportion of net debt to EBITDA for the last 12 months

Breach of the commitment clauses may lead to early repayment of the borrowed funds. ADVA minimizes risk through ongoing monitoring of financial metrics.

Within the scope of capital management, ADVA Optical Networking seeks to minimize interest expenses, provided that the availability of funds is not jeopardized. Excess funds are usually used to pay off debt. For USD bank accounts, a so-called cash pooling is implemented. Under this agreement, the funds will be transferred daily to a collective account. The interest is calculated on the basis of the combined balances.

(35) Other financial obligations and financial commitments

Lease commitments
The group has non-cancellable operating leases, primarily for buildings and cars. There are no sub-lease agreements.

The future minimum lease payments due on operating leases are listed in the table below:

(in thousands of EUR)	Dec. 31, 2018	Dec. 31, 2017
Up to one year	6,671	6,938
One to five years	14,959	11,045
More than five years	6,487	3,844
	28,117	21,827

Lease payments for buildings including parking spaces amount to EUR 5,994 thousand and EUR 5,711 thousand in 2018 and 2017, respectively. Lease payments for cars consisting of monthly installments plus servicing charges and road tax totaled EUR 1,628 thousand and EUR 1,541 thousand in 2018 and 2017, respectively.

Other obligations
On December 31, 2018, the group had purchase commitments totaling EUR 38,851 thousand (on December 31, 2017: EUR 31.206 thousand) in respect to suppliers.

Guarantees
Group entities have issued guarantees in favor of customers. On December 31, 2018, performance bonds with a maximum guaranteed amount of EUR 3,066 thousand were issued (on December 31, 2017: EUR 3,261 thousand). At year-end 2018, ADVA Optical Networking does not expect claims from these guarantees.

(36) Contingent liabilities

In the normal course of business, claims may be asserted, or lawsuits filed against the company and its subsidiaries from time to time. On December 31, 2018, ADVA Optical Networking does not expect that potential titles or litigations in detail or in total will have a material impact on its financial position or operating performance.

(37) Auditor's fees and other services from auditors

Since June 9, 2010, PricewaterhouseCoopers GmbH Wirtschaftsprüfungsgesellschaft (PwC), Munich, Member of the German Wirtschaftsprüfungskammer in Berlin, is the auditor of the company and the group. After internal rotation in 2014, Holger Graßnick is the responsible certified accountant for the company.

In 2018 and 2017, the following fees charged by the legal auditor were recognized as expenses:

(in thousands of EUR)	2018	2017
Year-end audit	373	443
Other consulting services	22	87
	395	530

In 2018, other consulting services mainly include services in the course of the implementation of new accounting standards.

(38) Stock option programs

To date, the company has issued stock options for employees (Plan XIV) and for management board (Plan XIVa) and stock appreciation rights for employees (Plan XV). Generally, both share-based compensation programs for the management board and employees of the company and its subsidiaries are still available for issuance of share-based compensation instruments.

All contracts stipulate a four-year vesting period and a total contractual life of seven years for the respective rights issue. The rights may only be exercised if the volume weighted average of the company share closing prices on the ten stock exchange trading days before the first day of each exercise period in which the option is exercised is at least 20% of the purchase price. In addition, the calculation of the maximum bonus for stock appreciation rights is based on the share price at the date of exercise, with the share price being capped at EUR 20.00. In addition, options issued to the management board from Plan XIV include a profit limitation. They are referred to as Plan XIVa.

All option rights are non-transferable. They may only be exercised as long as the entitled person is employed on a permanent contract by the company or by a company in which ADVA Optical Networking SE has direct or indirect interest. Option rights issued to apprentices may only be exercised if the apprentices are hired by the company or by an affiliated company on a permanent contract. All option rights expire upon termination of the employment contract. In the event that the person entitled dies, becomes unable to work or retires, special provisions come into force.

The group of people to whom option rights can be issued is defined separately for each stock option program. According to the resolution on June 13, 2018, 30.0% of option rights - in total 1,492,066 options rights - authorized pursuant to Plan XIV could be issued to members of the management board, 5.0% - in total 248,678 options rights - to the management of affiliated companies, 25.0% - in total 1,243,388 options rights - to company employees, and 40.0% - in total 1,989,422 options rights - to employees of affiliated companies. The management board specifies the exact group of people entitled to exercise rights and the scope of each offer. In case management board gets option rights, supervisory board will do so.

Subject to the conditions under which option rights are issued, each option right entitles the individual to purchase one common share in the company. The stock appreciation rights entitle the recipient to receive a bonus for difference between the defined strike price and the stock market price on the date of exercise (cash settlement). The company may opt to replace the granted stock appreciation rights with other participation rights as long as such other participation right economically equals the replaced stock appreciation right. The conditions of issue specify the term, the exercise price (strike price), any qualifying periods and the defined exercise periods.

Exercise periods are regularly linked to key business events in the company's calendar and each have a defined term. Certain other business events can lead to blocking periods, during which option rights cannot be exercised. Insofar as regular exercise periods overlap with such blocking periods, the exercise deadline shall be extended by the corresponding number of exercise days immediately after the end of such a blocking period. Option rights may be exercised only on days on which commercial banks are open in Frankfurt am Main, Germany.

In 2018, all stock appreciation rights from plan XV have been exercised or forfeited.

The fair value of stock options and stock appreciation rights is estimated by simulation (Monte Carlo method) using a program that was especially adjusted to the underlying plans and based on the assumed strategy for the exercise (earliest possible date).

The following computation parameters apply for option rights issued in 2018:

	Plan XIV	Plan XIVa
Weighted average share price (in EUR)	7.73	5.80
Weighted average strike price (in EUR)	7.80	5.79
Weighted expected volatility (in % per year)	46.36%	46.54%
Term (in years)	7	7
Weighted risk-free interest rate (in % per year)	-0.20%	-0.06%

The volatility is specified as fluctuation of the share price compared to the average share price of the period. In each case, expected volatility is calculated based on historic share prices (historic volatility). The risk-free interest rate is based on information on risk-free investments with corresponding terms.

For the calculation of the fair value of options, ADVA Optical Networking assumed that no dividends will be paid to stockholders.

The tables below present changes in the number of option rights outstanding.

Stock option program 2011 (Plan XIV)

	Number of options	Weighted average strike price (in EUR)
Options outstanding on Jan. 1, 2017	**1,853,677**	**7.11**
Granted options	754,000	4.98
Exercised options	-215,759	4.30
Forfeited options	-322,500	8.44
Expired options	-	-
Options outstanding on Dec. 31, 2017	**2,069,418**	**6.42**
Granted options	425,000	7.8
Exercised options	-195,406	4.15
Forfeited options	-110,700	6.66
Expired options	-23,100	3.93
Options outstanding on Dec. 31, 2018	**2,165,212**	**6,91**
Of which exercisable	225,412	4.31

The weighted average remaining contractual life for option rights outstanding on December 31, 2018 is 5.01 years (December 31, 2017: 5.04 years). The strike price for these options is between EUR 2.87 and EUR 10.16 (2017: between EUR 2.87 and EUR 10.16).

The average fair value of option rights granted in 2018 is EUR 3.13 (December 31, 2017: EUR 1.83).

Stock options exercised in 2018 had an average share price of EUR 6.83 on the exercise date.

Stock option program 2011 for the management board (Plan XIVa)

	Number of options	Weighted average strike price (in EUR)
Options outstanding on Jan. 1, 2017	**841,667**	**6.50**
Granted options	150,000	4.98
Exercised options	-	-
Forfeited options	-	-
Expired options	-	-
Options outstanding on Dec. 31, 2017	**991,667**	**6.27**
Granted options	175,000	5.79
Exercised options	-	-
Forfeited options	-	-
Expired options	-	-
Options outstanding on Dec. 31, 2018	**1,166,667**	**6.20**
Of which exercisable	290,000	4.15

The weighted average remaining contractual life for option rights outstanding on December 31, 2018, is 4.14 years (December 31, 2017: 4.72 years). The strike price for these options is between EUR 3.19 and EUR 8.70 (2017: between EUR 3.19 and EUR 8.70).

The average fair value of option rights granted in 2018 is EUR 2.10 (December 31, 2017: EUR 1.71).

Stock appreciation rights (Plan XV)

	Number of stock appreciation rights	Weighted average strike price(in EUR)
Stock appreciation rights outstanding on Jan. 1, 2017	**55,400**	**3.57**
Granted stock appreciation rights	-	-
Exercised stock appreciation rights	-15,200	3.57
Forfeited stock appreciation rights	-	-
Expired stock appreciation rights	-	-
Stock appreciation rights outstanding on Dec. 31, 2017	**40,200**	**3.57**
Granted stock appreciation rights	-	-
Exercised stock appreciation rights	-38,200	3.57
Forfeited stock appreciation rights	-	-
Expired stock appreciation rights	-2,000	3.57
Stock appreciation rights outstanding on Dec. 31, 2018	**-**	**-**

Stock appreciation rights (Plan XV) expired at August 15, 2018. The weighted average remaining contractual life for stock appreciation rights outstanding on December 31, 2017 was 0.73 years. The strike price for these stock appreciation rights was EUR 3.57 (2017: EUR 3.57).

Stock appreciation rights exercised in 2018 had an average share price of EUR 6.71 on the exercise date.

Compensation expenses arising from share-based compensation programs included in operating income were as follows:

(in thousands of EUR)	2018	2017
Plan XI	-	-1
Plan XIV	945	875
Plan XIVa	493	46
Plan XV	-25	28
Expense from stock options of MRV Inc.	-	311
	1,413	**1,259**

Due to expiry of stock appreciation rights, no liability arising from stock appreciation rights exists at December 31, 2018. At December 31, 2017, the liability arising from stock appreciation rights in the amount of EUR 145 thousand was included in current liabilities.

(39) Related party transactions

Teleios Capital Partners LLC Zug, Switzerland, EGORA Holding GmbH, Martinsried/Munich, and its subsidiaries (the EGORA group), Saguna Networks Ltd., Nesher, Israel, Arista Networks, Santa Clara, USA, Fraunhofer Heinrich Hertz Institute, Berlin, Harmonic Inc., San Jose, USA, and all members of the company's governing bodies and their relatives qualify as related parties to ADVA Optical Networking on December 31, 2018, in the sense of IAS 24.

Teleios Capital Partners LLC is an investment company based in Zug, Switzerland. On December 31, 2018, Teleios Capital Partners LLC and its subsidiaries held a 20.25% share in the equity of ADVA Optical Networking. No business relations existed with Teleios Capital Partners LLC.

On December 31, 2018, the EGORA group held a 14.93% share in the equity of ADVA Optical Networking.

ADVA Optical Networking SE holds 7.1% of the shares of Saguna Networks Ltd., Nesher, Israel. A service agreement with Saguna Networks Ltd. exists regarding the provision of development services for the companies of ADVA Optical Networking group.

In 2018, ADVA Optical Networking acquired components with an amount of EUR 75 thousand from the EGORA group (2017: EUR 15 thousand.) In 2018 and 2017, ADVA Optical Networking did not sell any products to the EGORA group.

ADVA Optical Networking has entered into several agreements with the EGORA group under which ADVA Optical Networking is entitled to make use of certain facilities and services of the EGORA group. In 2018 and 2017, these agreements were not utilized.

On December 31, 2018 and 2017, no trade accounts payable and provision existed in respect to EGORA group.

In 2018 and 2017, Saguna Networks Ltd. has not performed development services for the group.

In 2018, ADVA Optical Networking acquired no components from Arista Networks, Inc. (2017: EUR 43 thousand). On December 31, 2018, no trade accounts payable and provisions existed in respect to Arista Networks, Inc. (December 31, 2017: nil).

ADVA Optical Networking entered a service agreement with Fraunhofer Heinrich Hertz Institute. In 2018, ADVA Optical Networking acquired services with an amount of EUR 77 thousand (2017: EUR 88 thousand). On December 31, 2018, no trade accounts payable existed in respect to Fraunhofer Heinrich Hertz Institute (December 31, 2017: EUR 86 thousand).

In 2018, Harmonic Inc. acquired products with an amount of EUR 2 thousand from ADVA Optical Networking (December 31, 2017: EUR 11 thousand). On December 31, 2018 no trade receivables existed in respect to Harmonic Inc. (December 31, 2017: EUR 2 thousand).

All transactions with the related parties listed above are conducted on an arm's-length basis.

See note (40) for detailed information about compensation of the management board and the supervisory board.

(40) Governing boards and compensation

Management board

	Resident in	External mandates
Brian Protiva Chief executive officer	Berg, Germany	Member of the board of directors of AMS Technologies AG, Martinsried, Germany
Christoph Glingener Chief technology officer	Jade, Germany	Member of the board of trustees of Fraunhofer Heinrich Hertz Institute, Berlin, Germany
Ulrich Dopfer Chief financial officer	Alpharetta (Georgia), USA	-
Scott St. John Chief marketing & sales officer (since October 1, 2017)	Raleigh (North Carolina), USA	-

Supervisory board

	Resident in	Occupation	External mandates
Nikos Theodosopoulos Chairman	Manhasset (New York), USA	Founder and managing member, NT Advisors LLC, Manhasset, New York, USA	Member of the board of directors of Arista Networks, Inc., Santa Clara, CA, USA Member of the advisory board of Columbia Engineering Entrepreneurship, New York, NY, USA Member of the board of directors of Harmonic, Inc., San Jose, CA, USA Board member of Driving Management Systems, Inc., Colorado Springs, CO, USA
Johanna Hey Vice chairwoman	Cologne, Germany	Professor for tax law, University of Cologne, Cologne, Germany	Director of the Institut Finanzen und Steuern e.V., Berlin, Germany Member of the supervisory board of Gothaer Versicherungsbank VVaG, Cologne, Germany Member of the supervisory board of Gothaer Finanzholding AG, Cologne, Germany Member of the supervisory board of Cologne Executive School GmbH, Cologne, Germany Member of the supervisory board of Flossbach von Storch AG, Cologne, Germany
Hans-Joachim Grallert (until June 13, 2018)	Gröbenzell, Germany	Prof. em. Dr.-Ing.	Chairman of the management board "Eduard Rhein Foundation", Hamburg, Germany
Michael Aquino (since June 13, 2018)	Peachtree City, USA	Consultant	-

Compensation of the management board

The total management board compensation according to section 314 paragraph 1 no. 6a HGB was EUR 2,099 thousand in 2018 and EUR 1,538 thousand in 2017.

The value of benefits granted analyzes across the individual board members as follows:

(in thousands of EUR)	Fixed	Variable / bonus	Variable / issuance of stock options	Total 2018	Total 2017
Brian Protiva Chief executive officer	264	221	157	642	434
Christoph Glingener Chief technology officer	267	150	-	417	379
Ulrich Dopfer Chief financial officer	273	142	-	415	372
Scott St. John Chief marketing & sales officer (since October 1, 2017)	273	142	210	625	353

The fixed compensation includes non-performance-based considerations and fringe benefits (company car allowances). The variable compensation considers components related to short-term performance goals that are reported as current liabilities on December 31, 2018, as well as components based on long-term performance goals amounting to EUR 367 thousand (prior year: EUR 257 thousand) which in 2018 solely relate to issuance of options to Brian Protiva and Scott St. John (prior year: issuance of stock options to Scott St. John).

The total management board compensation according to IFRS amounts to EUR 2,242 thousand (prior year: EUR 1,735 thousand) and includes current considerations (fixed compensation, fringe benefits and current variable compensation) totaling EUR 1,749 thousand (prior year: EUR 1,298 thousand) as well as long-term incentive components amounting to EUR 493 thousand (prior year: EUR 437 thousand) which relate exclusively to remuneration components in connection with stock options.

The group paid pecuniary damage liability insurance premiums on behalf of members of the management board totaling EUR 13 thousand in 2018 and 2017 EUR 12 thousand (in equal amounts for each management board member), respectively.

In 2018 and 2017, no loans were granted to the members of the management board. At December 31, 2018, no receivables outstanding from members of the management board have been reported.

On December 31, the members of the management board held the following shares and stock options:

	Shares		Stock options	
	2018	2017	2018	2017
Brian Protiva Chief executive officer	401,030	401,030	335,000	260,000
Christoph Glingener Chief technology officer	-	-	325,000	325,000
Ulrich Dopfer Chief financial officer	500	500	256,667	259,667
Scott St. John Chief marketing & sales officer (since October 1, 2017)	-	-	250,000	150,000

On December 31, 2018, the options to members of the management board were granted out of Plan XIVa (on December 31, 2017: out of Plan XIV and Plan XIVa). In 2017, Ulrich Dopfer held options from Plan XIV that were granted before he joined the ADVA Optical Networking management board. The option rights authorize the management board to purchase the said number of common shares in the company once the qualifying period has elapsed. Plan XIVa includes a profit limit of EUR 20.00 per option, whereas Plan XIV has no profit limitations.

IFRS CONSOLIDATED FINANCIAL STATEMENTS
Other disclosures

The strike price for these option rights is

- EUR 5.05 for 100,000 options granted on August 15, 2012,
- EUR 3.90 for 130,000 options granted on November 15, 2013,
- EUR 3.19 for 60,000 options granted on May 15, 2014,
- EUR 5.15 for 150,000 options granted on May 15, 2015,
- EUR 8.70 for 401,667 options granted on May 15, 2016,
- EUR 4.98 for 150.000 options granted on November 15, 2017, and
- EUR 5.79 for 175.000 options granted on May 15, 2018, respectively.

The management board received cash inflows of EUR 9 thousand from the exercise of stock options in 2018.

Further information on compensation of the management board is included in the remuneration report in the group management report.

Compensation of the supervisory board

The fixed compensation to be paid to the supervisory board for 2018 and 2017 totaled EUR 235 thousand, respectively. This amount analyzes across the individual board members as follows:

(in thousands of EUR)	2018	2017
Nikos Theodosopoulos Chairman	100	100
Johanna Hey Vice chairwoman	90	90
Hans-Joachim Grallert (until June 13, 2018)	20	45
Michael Aquino (since June 13, 2018)	25	-

The compensation for the supervisory board of ADVA Optical Networking SE is paid out in quarterly installments. The fixed compensation for Q4 2018 amounting to EUR 59 thousand was paid out in January 2019. In the consolidated financial statements, this amount is recognized in other current liabilities.

The group paid pecuniary damage liability insurance premiums on behalf of members of the supervisory board totaling EUR 10 thousand in 2018 and 2017 EUR 12 thousand, respectively.

On December 31, 2018, no shares or stock options were held by members of the supervisory board (December 31, 2017: none).

Further information on compensation of the supervisory board is included in the remuneration report in the group management report.

EVENTS AFTER THE BALANCE SHEET DATE

There were no events after the balance sheet date that materially affected the net assets and financial position of the group on December 31, 2018, or its financial performance for 2018. Similarly, there were no events considered material for disclosure.

Declaration of compliance with the German Corporate Governance Code

Pursuant to section 161 of the German Stock Corporation Law (AktG), the management board and the supervisory board have issued a declaration of compliance with the German Corporate Governance Code. This declaration is published on the group's website www.advaoptical.com.

Meiningen, February 19, 2019

Brian Protiva   Christoph Glingener

Ulrich Dopfer   Scott St. John

Affirmative declaration of the legal representatives

We, the members of the management board of ADVA Optical Networking SE, to the best of our knowledge affirm that, in accordance with the applicable reporting principles, the management report and the consolidated financial statements of the ADVA Optical Networking group represent a true and fair view of the net assets, financial position and performance of the group, together with a description of the principal opportunities and risks associated with the expected development of the group.

Meiningen, February 19, 2019

Brian Protiva   Christoph Glingener

Ulrich Dopfer   Scott St. John

Independent auditor's report

To ADVA Optical Networking SE, Meiningen

Report on the audit of the consolidated financial statements and of the group management report

AUDIT OPINIONS

We have audited the consolidated financial statements of ADVA Optical Networking SE, Meiningen, and its subsidiaries (the Group), which comprise the consolidated statement of financial position as at 31 December 2018, and the consolidated statement of comprehensive income, consolidated statement of profit or loss, consolidated statement of changes in equity and consolidated statement of cash flows for the financial year from 1 January to 31 December 2018, and notes to the consolidated financial statements, including a summary of significant accounting policies. In addition, we have audited the group management report of ADVA Optical Networking SE, which is combined with the Company's management report, for the financial year from 1 January to 31 December 2018. We have not audited the content of those parts of the group management report listed in the "Other Information" section of our auditor's report.

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

- the accompanying consolidated financial statements comply, in all material respects, with the IFRSs as adopted by the EU, and the additional requirements of German commercial law pursuant to § [Article] 315e Abs. [paragraph] 1 HGB [Handelsgesetzbuch: German Commercial Code] and, in compliance with these requirements, give a true and fair view of the assets, liabilities, and financial position of the Group as at 31 December 2018, and of its financial performance for the financial year from 1 January to 31 December 2018, and
- the accompanying group management report as a whole provides an appropriate view of the Group's position. In all material respects, this group management report is consistent with the consolidated financial statements, complies with German legal requirements and appropriately presents the opportunities and risks of future development. Our audit opinion on the group management report does not cover the content of those parts of the group management report listed in the "Other Information" section of our auditor's report.

Pursuant to § 322 Abs. 3 Satz [sentence] 1 HGB, we declare that our audit has not led to any reservations relating to the legal compliance of the consolidated financial statements and of the group management report.

BASIS FOR THE AUDIT OPINIONS

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

KEY AUDIT MATTERS IN THE AUDIT OF THE CONSOLIDATED FINANCIAL STATEMENTS

Key audit matters are those matters that, in our professional judgment, were of most significance in our audit of the consolidated financial statements for the financial year from 1 January to 31 December 2018. These matters were addressed in the context of our audit of the consolidated financial statements as a whole, and in forming our audit opinion thereon; we do not provide a separate audit opinion on these matters.

In our view, the matters of most significance in our audit were as follows:

1) Recoverability of goodwill

2) Accounting treatment of internally generated intangible assets

3) Accounting treatment of deferred taxes

Our presentation of these key audit matters has been structured in each case as follows:

1. Matter and issue

2. Audit approach and findings

3. Reference to further information

Hereinafter we present the key audit matters:

1) Recoverability of goodwill

1. In the Company's consolidated financial statements goodwill amounting to EUR 70,400 thousand is reported. Goodwill is tested for impairment by the Company once a year or when there are indications of impairment to determine any possible need for write-downs. The impairment test is carried out at the level of the groups of cash-generating units to which the relevant goodwill is allocated. The carrying amount of the relevant cash generating units, including goodwill, is compared with the corresponding recoverable amount in the context of the impairment test. The recoverable amount is generally determined using the value in use. The present value of the future cash flows from the respective group of cash-generating units normally serves as the basis of valuation. Present values are calculated using discounted cash flow models. For this purpose, the adopted medium-term business plan of the Group forms the starting point which is extrapolated based on assumptions about long-term rates of growth. Expectations relating to future market developments and assumptions about the development of macroeconomic factors are also taken into account. The discount rate used is the weighted average cost of capital for the relevant group of cash-generating units. The impairment test determined that no write-downs were necessary.

The outcome of this valuation is dependent to a large extent on the estimates made by the executive directors with respect to the future cash inflows from the respective group of cash-generating units, the discount rate used, the rate of growth and other assumptions, and is therefore subject to considerable uncertainty. Against this background and due to the complex nature of the valuation, this matter was of particular significance in the context of our audit.

2. As part of our audit, we assessed the methodology employed for the purposes of performing the impairment test, among other things. After matching the future cash inflows used for the calculation against the adopted medium-term business plan of the Group, we assessed the appropriateness of the calculation, in particular by reconciling it with general and sector-specific market expectations. In addition, we assessed the appropriate consideration of the costs for Group functions. In the knowledge that even relatively small changes in the discount rate applied can have a material impact on the value in use calculated in this way, we focused our testing in particular on the parameters used to determine the discount rate applied and assessed the calculation model. In order to reflect the uncertainty inherent in the projections, we evaluated the sensitivity analyses performed by the Company.

Overall, the valuation parameters and assumptions used by the executive directors are in line with our expectations and are within the ranges considered by us to be reasonable.

3. The Company's disclosures on goodwill are contained in sections (6) Recognition and measurement, (7) Significant accounting judgments, estimates and assumptions and (15) Fixed assets in the notes to the consolidated financial statements.

2) Accounting treatment of internally generated intangible assets

1. In the Company's consolidated financial statements an amount of EUR 87,926 thousand is reported under the balance sheet item "capitalized development projects". This item represents development costs incurred for new products, which have been capitalized in accordance with the provisions of IAS 38 and have already been partially amortized in line with their useful lives. An impairment test is carried out at least once annually for projects still under development in accordance with IAS 36. Own expenses capitalized in accordance with these provisions during the financial year amounted to EUR 31,872 thousand, representing a reduction in the expenses charged to profit or loss. The eligibility of the development expenses for capitalization depends on the criteria established by IAS 38.57 and includes considerable scope for judgment, for example with respect to future cash inflows or the expected useful lives of the products developed. Against this background and due to the underlying complexity of the methodological requirements relating to measurement and eligibility for capitalization, this matter was of particular significance for our audit.

2. As part of our audit, we evaluated the internal processes and controls for recording the development projects, among other things. We also assessed the methodology used to calculate the expenses eligible for capitalization. We assessed the eligibility for capitalization of material projects on the basis of the criteria set out in IAS 38.57. We evaluated the stage of progress of the particular project by means of discussions with members of staff in the R&D controlling department and inspection of the project documentation. We assessed the amount of the development costs capitalized and the recoverability of the development expenditure on the basis of suitable supporting evidence. In our view, the methodology applied by the Company for capitalizing development projects is appropriate, and the stage of completion of the projects and the development costs capitalized have been clearly documented.

3. The Company's disclosures on internally generated intangible assets are contained in sections (6) Recognition and measurement, (7) Significant accounting judgments, estimates and assumptions, (15) Fixed assets, (26) Income taxes and (31) Segment reporting in the notes to the consolidated financial statements.

3) Accounting treatment of deferred taxes

1. After netting, deferred tax assets amounting to EUR 7,315 thousand and deferred tax liabilities of EUR 10,828 thousand are reported in the Company's consolidated financial statements. Deferred tax assets were recognized to the extent that the executive directors consider it probable that taxable profit will be available in the foreseeable future which will enable the deductible temporary differences and unused tax losses to be utilized. For this purpose, insofar as sufficient deferred tax liabilities are not available, future taxable profits are projected on the basis of the business plan. No deferred tax assets were recognized in respect of unused tax losses and other deductible temporary differences amounting in total to EUR 201,741 thousand, since it is currently not probable that they will be utilized for tax purposes by means of offsetting against taxable profits. Deferred tax liabilities mainly arise from differences between the carrying amounts of the development projects as well as the goodwill recognized at company level in accordance with IFRSs and their tax bases in accordance with the applicable tax laws. From our point of view, the accounting treatment of deferred taxes was of particular significance in the context of our audit, as it depends to a large extent on the estimates and assumptions made by the executive directors and is therefore subject to uncertainties.

2. As part of our audit, we assessed, among other things, the internal processes and controls for recording tax matters as well as the methodology used for the determination, accounting treatment and measurement of deferred taxes. We also assessed the recoverability of the deferred tax assets relating to deductible temporary differences and unused tax losses on the basis of the Company's internal forecasts of its future earnings situation, and the appropriateness of the underlying estimates and assumptions.

Based on our audit procedures, we were able to satisfy ourselves that the estimates and assumptions made by the executive directors are substantiated and sufficiently documented.

3.The Company's disclosures on deferred taxes are contained in sections (6) Recognition and measurement, (7) Significant accounting judgments, estimates and assumptions and (26) Income taxes in the notes to the consolidated financial statements.

OTHER INFORMATION

The executive directors are responsible for the other information. The other information comprises the following non-audited parts of the group management report, which we obtained prior of the date of our auditor's report:

- the statement on corporate governance pursuant to § 289f HGB and § 315d HGB included in section "Declaration on corporate governance and corporate governance report" of the group management report
- the corporate governance report pursuant to No. 3.10 of the German Corporate Governance Code

The other information comprises further the remaining parts of the annual report, which we obtained prior to the date of our auditor's report, – excluding cross-references to external information – with the exception of the audited consolidated financial statements, the audited group management report and our auditor's report.

The separate non-financial report pursuant to § 289b Abs. 3 HGB and § 315b Abs. 3 HGB is expected to be made available to us after the date of the auditor's report.

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

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

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

RESPONSIBILITIES OF THE EXECUTIVE DIRECTORS AND THE SUPERVISORY BOARD FOR THE CONSOLIDATED FINANCIAL STATEMENTS AND THE GROUP MANAGEMENT REPORT

The executive directors are responsible for the preparation of the consolidated financial statements that comply, in all material respects, with IFRSs as adopted by the EU and the additional requirements of German commercial law pursuant to § 315e Abs. 1 HGB and that the consolidated financial statements, in compliance with these requirements, give a true and fair view of the assets, liabilities, financial position, and financial performance of the Group. In addition, the executive directors are responsible for such internal control as they have determined necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the consolidated financial statements, the executive directors are responsible for assessing the Group's ability to continue as a going concern. They also have the responsibility for disclosing, as applicable, matters related to going concern. In addition, they are responsible for financial reporting based on the going concern basis of accounting unless there is an intention to liquidate the Group or to cease operations, or there is no realistic alternative but to do so.

Furthermore, the executive directors are 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 executive directors are responsible for such arrangements and measures (systems) as they have considered 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 objectives are to obtain reasonable assurance about whether the consolidated financial statements as a whole are free from material misstatement, whether due to fraud or error, and whether the group management report as a whole provides an appropriate view of the Group's position and, in all material respects, is consistent with the consolidated financial statements and the knowledge obtained in the audit, complies with the German legal requirements and appropriately presents the opportunities and risks of future development, as well as to issue an auditor's report that includes our audit opinions on the consolidated financial statements and on the group management report.

Reasonable assurance is a high level of assurance but is not a guarantee that an audit conducted in accordance with § 317 HGB and the EU Audit Regulation and in compliance with German Generally Accepted Standards for Financial Statement Audits promulgated by the Institut der Wirtschaftsprüfer (IDW) will always detect a material misstatement. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these consolidated financial statements and this group management report.

We exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the consolidated financial statements and of the group management report, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our audit opinions. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit of the consolidated financial statements and of arrangements and measures (systems) 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 purpose of expressing an audit opinion on the effectiveness of these systems.
- Evaluate the appropriateness of accounting policies used by the executive directors and the reasonableness of estimates made by the executive directors and related disclosures.
- Conclude on the appropriateness of the executive 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 respective audit opinions. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the Group to cease to be able to continue as a going concern.
- Evaluate the overall presentation, structure and content of the consolidated financial statements, including the disclosures, and whether the consolidated financial statements present the underlying transactions and events in a manner that the consolidated financial statements give a true and fair view of the assets, liabilities, financial position and financial performance of the Group in compliance with IFRSs as adopted by the EU and the additional requirements of German commercial law pursuant to § 315e Abs. 1 HGB.
- Obtain sufficient appropriate audit evidence regarding the financial information of the entities 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.

- Evaluate the consistency of the group management report with the consolidated financial statements, its conformity with German law, and the view of the Group's position it provides.
- Perform audit procedures on the prospective information presented by the executive directors in the group management report. On the basis of sufficient appropriate audit evidence we evaluate, in particular, the significant assumptions used by the executive directors as a basis for the prospective information, and evaluate the proper derivation of the prospective information from these assumptions. We do not express a separate audit opinion on the prospective information and on the assumptions used as a basis. There is a substantial unavoidable risk that future events will differ materially from the prospective information.

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

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

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

Other legal and regulatory requirements

FURTHER INFORMATION PURSUANT TO ARTICLE 10 OF THE EU AUDIT REGULATION

We were elected as group auditor by the annual general meeting on 13 June 2018. We were engaged by the supervisory board on 23 August 2018. We have been the group auditor of the ADVA Optical Networking SE, Meiningen, without interruption since the financial year 2010.

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

GERMAN PUBLIC AUDITOR RESPONSIBLE FOR THE ENGAGEMENT

The German Public Auditor responsible for the engagement is Holger Graßnick.

Munich, February 19, 2019

PricewaterhouseCoopers GmbH
Wirtschaftsprüfungsgesellschaft

sgd. Holger Graßnick Wirtschaftsprüfer (German Public Auditor)	sgd. ppa. Sonja Knösch Wirtschaftsprüferin (German Public Auditor)

Additional Information

Quarterly Overview 2017-2018

(IFRS, in thousands of EUR, except stated otherwise)	2018 Q1	2018 Q2	2018 Q3	2018 Q4	2017 Q1	2017 Q2	2017 Q3	2017 Q4
INCOME STATEMENT								
Revenues	120,538	123,752	126,178	131,513	141,835	144,225	111,173	117,238
Pro forma cost of goods sold	-76,275	-78,363	-78,874	-82,848	-95,712	-97,543	-72,066	-74,773
Pro forma gross profit	44,263	45,389	47,304	48,665	46,123	46,682	39,107	42,465
Pro forma selling and marketing expenses	-15,348	-15,375	-14,515	-15,772	-15,939	-14,625	-14,348	-15,601
Pro forma general and administrative expenses	-8,853	-9,414	-7,640	-8,587	-8,177	-8,871	-8,230	-8,720
Pro forma research and development expenses	-27,882	-26,420	-26,219	-26,644	-27,324	-27,091	-26,751	-24,580
Income from capitalization of development expenses	7,973	7,865	7,060	8,974	10,748	11,447	8,566	8,272
Other operating income and expenses, net	2,086	4,100	786	1,470	1,210	1,649	850	2,660
Pro forma operating income	2,239	6,145	6,776	8,106	6,641	9,191	-806	4,496
Amortization of intangible assets from acquisitions	-1,347	-1,373	-1,395	-1,411	-782	-776	-1,389	-1,479
Stock compensation expenses	-348	-354	-359	-352	-358	-323	-896	318
Restructuring expense	-968	-331	-28	-11	-	-	-8,393	-1,041
Operating income (loss)	-424	4,087	4,994	6,332	5,501	8,092	-11,484	2,294
Interest income and expenses, net	-228	-435	-364	-381	-191	-83	-176	-335
Other financial gains and losses, net	-1,894	1,272	100	-574	-1,002	-1,424	-190	-1,193
Income (loss) before tax	-2,546	4,924	4,730	5,377	4,308	6,585	-11,850	766
Income tax benefit (expense), net	106	-347	-822	-1,744	1,877	-2,061	-2,139	-1,714
Net income (loss)	-2,440	4,577	3,908	3,633	6,185	4,524	-13,989	-948
Earnings per share in EUR								
basic	-0.05	0.09	0.08	0.07	0.12	0.09	-0.28	-0.02
diluted	-0.05	0.09	0.08	0.07	0.12	0.09	-0.28	-0.02
BALANCE SHEET (as of period end)								
Cash and cash equivalents	57,695	59,656	53,949	62,652	69,709	80,774	57,150	58,376
Inventories	73,048	76,263	80,100	85,734	81,698	77,331	90,725	81,694
Goodwill	67,186	69,946	69,914	70,400	41,127	39,643	68,741	68,036
Capitalized development projects	86,481	87,097	86,442	87,926	81,302	86,665	83,807	85,175
Other intangible assets	34,559	33,896	32,251	31,524	17,266	16,489	31,946	36,916
Total intangible assets	188,226	190,939	188,607	189,850	139,695	142,797	184,494	190,127
Other assets	139,291	147,855	157,432	148,302	172,714	162,017	161,326	133,691
Total assets	458,260	474,713	480,088	486,538	463,816	462,919	493,695	463,888
Total stockholders' equity	223,468	233,201	238,608	244,641	244,466	245,032	228,618	227,021
Net liquidity	-44,180	-36,594	-38,656	-26,832	15,029	30,779	-44,097	-38,185
CASH FLOW STATEMENT								
Cash flow from operating activities	5,647	18,074	9,508	27,131	5,623	29,615	-25,858	17,754
Gross capital expenditures for property, plant and equipment and other intangible assets	-2,930	-2,715	-4,544	-6,207	-5,220	-2,629	-3,140	-4,551
EMPLOYEES								
(as of period end)	1,848	1,842	1,862	1,886	1,783	1,808	1,963	1,894

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Additional Information
Multi-Year Overview 2008 - 2018

Multi-Year Overview 2008 - 2018

(in thousands of EUR except stated otherwise)	2008 IFRS	2009 IFRS	2010 IFRS	2011 IFRS	2012 IFRS	2013 IFRS	2014 IFRS	2015 IFRS	2016 IFRS	2017 IFRS	2018 IFRS	Change 2018 vs. 2017
INCOME STATEMENT												
Revenues	217,672	232,808	291,725	310,945	330,069	310,702	339,168	441,938	566,686	514,471	501,981	-2%
Pro forma cost of goods sold	-128,854	-140,041	-181,874	-191,560	-196,820	-188,561	-220,408	-284,521	-398,161	-340,094	-316,360	-7%
Pro forma gross profit*	88,818	92,767	109,851	119,385	133,249	122,141	118,760	157,417	168,525	174,377	185,621	6%
Pro forma general administrative, selling and marketing expenses	-60,385	-60,005	-66,224	-67,418	-71,984	-72,942	-75,154	-85,410	-90,944	-94,511	-95,504	1%
Pro forma research and development expenses	-40,682	-40,714	-49,391	-60,083	-65,055	-65,649	-67,461	-78,493	-99,260	-105,746	-107,165	1%
Income from capitalization of development expenses	12,056	12,404	15,291	23,648	23,529	22,490	27,108	32,071	39,282	39,033	31,872	-18%
Restructuring expenses	-2,251	-	-	-	-	-	-	-	-	-	-	-
Other operating income and expenses, net	1,736	1,650	3,761	1,751	2,059	2,531	6,214	4,392	5,812	6,369	8,442	33%
Pro forma operating income (loss)	-708	6,102	13,288	17,283	21,798	8,571	9,467	29,977	23,415	19,522	23,266	19%
Amortization of intangible assets and goodwill from acquisitions	-4,574	-2,443	-2,141	-2,493	-1,620	-683	-733	-346	-2,997	-4,426	-5,526	25%
Stock compensation expenses	-1,761	-1,378	-1,848	-1,583	-1,344	-913	-382	-2,876	-1,051	-1,259	-1,413	12%
Restructuring expenses	-	-	-	-	-	-	-	-	-	-9,434	-1,338	-86%
Operating income (loss)	-7,043	2,281	9,299	13,207	18,834	6,975	8,352	26,755	19,367	4,403	14,989	240%
Interest income and expenses, net	-1,005	-1,215	-1,439	-1,531	-1,163	-1,144	-1,267	-838	-60	-785	-1,408	79%
Other financial gains and losses, net	-1,103	543	3,130	2,328	834	-1,475	1,142	2,159	-292	-3,809	-1,096	-71%
Income (loss) before tax	-9,151	1,609	10,990	14,004	18,505	4,356	8,227	28,076	19,015	-191	12,485	-6,637%
Income tax benefit (expense), net**	275	-289	-3,983	2,935	-1,783	7,279	148	-1,228	2,517	-4,037	-2,807	-30%
Net income (loss)**	-8,876	1,320	7,007	16,939	16,722	11,635	8,375	26,848	21,532	-4,228	9,678	-329%
Earnings per share in EUR**												
basic	-0.19	0.03	0.15	0.36	0.35	0.24	0.17	0.55	0.44	-0.09	0.19	-311%
diluted	-0.19	0.03	0.15	0.35	0.34	0.24	0.17	0.55	0.43	-0.09	0.19	-311%
BALANCE SHEET (as of December 31)												
Cash and cash equivalents	46,560	50,882	54,085	59,110	70,625	80,934	83,877	93,850	84,871	58,376	62,652	7%
Inventories	26,961	25,400	39,588	36,536	41,339	40,074	46,982	72,950	92,800	81,694	85,734	5%
Goodwill	18,854	19,103	19,653	19,842	19,876	19,875	23,581	24,881	41,538	68,036	70,400	3%
Capitalized R&D expenses	19,829	25,449	29,571	39,231	47,497	52,080	56,438	62,439	76,263	85,175	87,926	3%
Other intangible assets	12,926	9,991	7,467	5,541	3,586	2,699	2,861	4,238	16,429	36,785	31,524	-14%
Total intangible assets	51,609	54,543	56,691	64,614	70,959	74,654	82,880	91,558	134,230	189,996	189,850	0%
Other assets**	70,670	66,172	83,758	99,636	101,172	103,544	111,098	133,177	132,651	133,822	148,302	11%
Total assets**	195,800	196,997	234,122	259,896	284,095	299,206	324,837	391,535	444,552	463,888	486,538	5%
Total stockholders' equity**	97,998	101,270	115,414	135,986	153,909	163,948	177,114	215,921	238,947	227,021	244,641	8%
Net liquidity	12,378	22,534	24,650	31,163	41,600	41,724	48,885	51,181	25,506	-38,185	-26,832	-30%
CASH FLOW STATEMENT												
Cash flow from operating activities	23,343	29,105	21,100	39,736	45,156	31,413	46,186	39,415	61,350	27,134	60,360	122%
Gross capital expenditures for property, plant and equipment and other intangible assets	-5,800	-6,783	-8,468	-9,507	-11,123	-7,707	-8,954	-8,836	-14,802	-15,540	-16,396	6%
EMPLOYEES												
(as of December 31)	1,042	1,100	1,203	1,304	1,378	1,425	1,491	1,524	1,764	1,894	1,886	0%

* From 2012, amortization for capitalized development projects is presented as cost of goods sold; prior period information has been adjusted accordingly.

** In a retrospective restatement, deferred tax assets as of December 31, 2013, were increased by EUR 6,128 thousand. As a result, the line items "income tax benefit (expense), net", "net income" and "basic and diluted earnings per share" in the consolidated income statement in 2013 were increased accordingly. From 2017, deferred tax assets and liabilities are reported net according to IAS 12.74. 2016 reporting has been adjusted accordingly.

Glossary

A

ALM (advanced link monitoring)

ALM is a device that provides non-intrusive monitoring of fiber access networks independent of the services running over that fiber.

C

CAGR

The compound annual growth rate is the rate of return that would be required for an investment to grow from its beginning balance to its ending balance, assuming the profits were reinvested at the end of each year of the investment's lifespan.

Carrier

Carriers, in general, are companies that build and maintain communications networks for commercial use. Beyond incumbent telephony companies, these also include new alternative carriers, which were established during the deregulation of the telecommunications market, and special service providers, which offer outsourced services (e.g., software applications or data storage) for enterprise customers.

Carrier Ethernet (CE)

Ethernet is a protocol of packet-based data transfer that was originally developed and used for local area networks. Carriers require additional features for data transmission in wide area networks that go beyond traditional Ethernet. The CE protocol resulting from these requirements has become the dominant data link protocol in carrier infrastructure.

Cesium clocks

Many network services and applications require the availability of a highly accurate primary frequency reference. This can be achieved using Cesium atomic clocks. Unlike off-air receivers, Cesium clocks are autonomous, self-contained primary references immune to external influences.

Cloud

Cloud in the context of IT describes a concept where applications no longer run on the user's in-house IT infrastructure (for example, a server) but are outsourced to a service provider whose IT infrastructure is not visible or known in detail – as if it was hidden in a cloud. A typical example is the use of software as a service, where the software is not stored on the user's machine, but on servers of the software service provider.

CloudConnect™

FSP 3000 CloudConnect™ a version of the FSP 3000 platform, specifically designed for hyper-scale data center interconnect.

ConnectGuar™

Brand name for ADVA's encryption technology, implemented in many of the company's products.

COSO framework

Five major accounting organizations formed a group known as COSO (Committee of Sponsoring Organizations of the Treadway Commission) to provide guidance on evaluating internal control. They issued this guidance as the COSO Internal Control Framework.

CPE (customer premise equipment)

Terminal equipment located at a subscriber's premise and connected with a carrier's telecommunications network.

CSP (communication service provider)

CSPs are companies that build and maintain large-scale networks to offer communication services.

D

DCI (data center interconnect)

Network that connects geographically dispersed data centers.

DevOps (development and operations)

The term DevOps has its origins in software development. It describes a methodology that stresses communication, collaboration and cooperation between software developers and other information-technology (IT) professionals. In a broader sense DevOps refers to the tight alignment between product development teams and operational teams responsible for product introduction.

DSL (digital subscriber line)

DSL is a technology that provides fast digital data transmission over the copper wires of a local telephone network. The advantage of DSL is that broadband services like fast Internet access and Internet television signals can be delivered over the same twisted pair of copper wires that was originally deployed for phone service only.

DWDM (dense wavelength division multiplexing)

DWDM is a standardized WDM technology that uses up to 192 different wavelengths for data transmission over a single fiber. DWDM uses a 'dense' wavelength grid that requires high-precision optical components, maximizing the bandwidth per fiber. See also WDM (Wavelength Division Multiplexing).

E

Ensemble

Ensemble is a trademark used by ADVA for the company's software solutions.

Ensemble Connector

Ensemble Connector is a family of software packages that enables communication service providers to provide the data path and virtual hosting functionality at a location of their choice.

ePRTC (enhanced primary reference time clocks)

Synchronization in communication networks is organized hierarchically and requires primary reference sources, so-called primary reference time clocks (PRTC). An ePRTC system provides additional security against GNSS outages, allowing a network operator to take back control over the time source used for network synchronization.

Ethernet

Ethernet is a packet-based data transmission protocol with a data rate of 10Mbit/s. Fast Ethernet provides a data rate of 100Mbit/s, Gigabit Ethernet 1Gbit/s and 10 Gigabit Ethernet 10Gbit/s. Today also 40 and 100 Gigabit Ethernet solutions are commercially available with data rates of 40Gbit/s and 100Gbit/s, respectively.

F

Fronthaul

Umbrella term for transmission solutions in mobile broadband networks that connect baseband units with remote radio heads.

FSE (Frankfurt stock exchange)

Main stock exchange in Germany, where ADVA is listed

FSP (Fiber Service Platform)

The Fiber Service Platform is ADVA's comprehensive product portfolio that provides carriers and enterprises with innovative connectivity solutions for access, metro and long-haul networks.

FTTx (fiber-to-the-x)

FTTx is an umbrella term for fiber-based access networks, where x defines the end point of the fiber network. One example is FTTC (fiber-to-the-curb) where the fiber network is terminated in a street cabinet (at the curb) and the remaining distance to the end user is bridged by some other – in most cases existing – media, such as copper. Many network operators see FTTH (fiber-to-the-home) as the ultimate solution. In a FTTH scenario the fiber is deployed all the way to individual homes.

G

Gbit/s or G (Gigabit per second)

Bits are binary symbols of zero or one and are the standard unit by which data is stored and processed by computers. "Giga" stands for one billion (1,000,000,000). Bit/s is the basic unit of a data rate, which describes how many bits per second are being transmitted. One Gbit/s or G is therefore a data rate that transmits one billion bits of data per second.

Matthias Hornbogen

"Every day there's a new challenge.
And every day we work as team
to find the best way forward together."

GNSS (global navigation satellite system)

GNSS refers to a constellation of satellites transmitting positioning and timing data from space. GNSS receivers determine their location by using that data. By definition, a GNSS provides global coverage.

GRI (Global Reporting Initiative)

GRI is an independent, multi-stakeholder network dedicated to developing globally applicable sustainability reporting guidelines.

I

ICP (internet content provider)

Internet content providers are entities whose primary business is the creation, storage and dissemination of digital information. ICPs are also commonly referred to as over-the-top (OTT), web 2.0 and digital media companies.

IoT (internet of things)

Network of devices such as vehicles, and home appliances that contain electronics, software, sensors, actuators, and connectivity which allows these things to connect, interact and exchange data.

ISO (International Standards Organization)

ISO is an organization that defines and publishes internationally valid standards. Several of the ISO standards are relevant to ADVA, including 9001 (quality management), 14001 (environmental management system), 22301 (business continuity management), 31000 (risk management) and 50001 (energy management).

L

LTE (long term evolution) / LTE-Advanced / LTE-TDD

LTE is the project name of a high-performance air interface for cellular mobile communication systems. It is often used as the synonym for the 4th generation (4G) of radio technologies designed to increase the capacity and speed of mobile networks. LTE-Advanced provides further enhancements to the LTE technology, enabling operators to deliver even more bandwidth to more mobile users. The TDD (time division duplex) version of the standard uses a single frequency for uploading and downloading data, alternating between the two through time.

M

Mbit/s (Megabit per second)

Bits are binary symbols of zero or one and are the standard unit by which data is stored and processed by computers. ”Mega” stands for one million (1,000,000). Bit/s is the basic unit of a data rate, which describes how many bits per second are being transmitted. One Mbit/s is therefore a data rate that transmits one million bits of data per second.

MSO (multiple service operator)

The term MSO emerged in the 1990s when cable television companies, mainly in the U.S., started to offer telecom services in addition to their traditional television and video offerings. Technically, most telecom service providers today could be called multiservice operators, but the term MSO still implies the historical roots in the cable television space.

N

Net liquidity

Net liquidity is calculated by subtracting current and non-current financial liabilities as well as current and non-current finance lease obligations from cash and cash equivalents.

Net promoter score (NPS)

The NPS is obtained by asking customers a single question on a 0 to 10 rating scale: “How likely is it that you would recommend our company to a friend or colleague?” Based on their responses, customers are categorized into one of three groups: promoters (9–10 rating), passives (7–8 rating), and detractors (0–6 rating). The percentage of detractors is then subtracted from the percentage of promoters to obtain a net promoter score.

NFV (network functions virtualization)

NFV is an alternative design approach for building complex IT applications, particularly in the telecommunications and service provider industries. NFV virtualizes entire classes of functions into building blocks that may be connected, or chained, together to create services. With the introduction of NFV the architecture of service provider networks will change. Functions that were previously tied to a particular network element can now hosted centrally leading to a new distribution of hardware and software functionality across networks.

NTP (network timing protocol)

NTP is a networking protocol for clock synchronization between computer systems over packet-switched, variable-latency data networks.

O

OEM (original equipment manufacturer)

OEM partners purchase products from other companies to fill gaps in their portfolio and offer an end-to-end solution. They typically re-label and market the products under their own brand name.

OLS (open line system)

An optical transmission system basically consists of two components: The terminal generates and receives the optical signals. The line system bundles wavelengths and amplifies the signal power. In an open system architecture, terminals and line systems can be deployed independently

OTN (optical transport network)

The G.709 recommendation of the ITU-T (Telecommunication Standard Sector of the International Telecommunication Union) – commonly known by the name OTN – is a standardized method for the transparent transmission of data over optical wavelengths in DWDM systems. OTN is often quite popular with carriers that operate wide area networks.

P

Pro forma operating income

Pro forma operating income is calculated prior to non-cash charges related to the stock compensation programs and amortization and impairment of goodwill and acquisition-related intangible assets. Additionally, non-recurring expenses related to restructuring measures are not included.

Protocol

A protocol defines the “language” elements that networks use to communicate with each other.

PTP grandmaster

The Precision Time Protocol (PTP) is a protocol used to synchronize clocks throughout a network. The grandmaster is a reference point that delivers precise synchronization. See also: IEEE 1588v2 Mini-Grandmaster Clock.

R

ROADM (reconfigurable optical add/drop multiplexer)

ROADM is an innovative functionality in optical networks that enables cost-effective switching of wavelengths.

S

SDN (software-defined networking)

SDN is an approach to building networks where the control function is separated from the forwarding engine. I.e., SDN decouples the system that makes decisions about where traffic is sent from the underlying hardware that forwards traffic to the selected destination. SDN has the potential to be disruptive to the networking industry and is seen as a key enabler on the road to network virtualization.

SFP (small form-factor pluggable)

The SFP is a standardized, compact, pluggable transceiver used for both telecommunication and data communications applications.

SLA (service-level agreement)

Commitment between a service provider and a client. Aspects of the service such as quality and availability are agreed between the service provider and the service user.

SSU (synchronization supply unit)

Many services running on digital telecommunication networks require accurate synchronization for correct operation. Telecommunication networks rely on the use of highly accurate primary reference clocks (see also Cesium Clocks), which are distributed network wide using synchronization links and synchronization supply units.

T

TeraFlex™

Brand name for ADVA's high-speed terminal, which generates data rates of up to 600Gbit/s per wavelength. TeraFlex is a so-called open terminal (OT) and part of the ADVA FSP 3000 platform.

TIP (Telecom Infra Project)

TIP is a community of companies building a dynamic, collaborative telecommunications ecosystem to accelerate technological advances in communications infrastructure. TIP was launched in February 2016. Members include besides ADVA well-known companies such as British Telecom, Deutsche Telekom, facebook, and Vodafone.

TL 9000

TL 9000 is a quality management system standard defined specifically for the telecommunications industry. It standardizes the quality system requirements for the design, development, delivery, installation and maintenance of telecommunication products and services, and it also defines the performance metrics required to measure the situation at the time of the implementation of the standard as well as progress made.

U

uCPE (universal customer premise equipment)

A CPE is a terminal unit located at a subscriber's premises and connected with a carrier's telecommunication network. The CPE provides demarcation functionality between the network domains of the service provider and his client. In the context of NFV, certain functions of the CPE can be virtualized and hosted centrally in the service provider network. This software package defining the CPE function is called virtual CPE (vCPE). In this architecture CSPs can define a universally usable CPE (hardware) to define different services via software.

V

VAR (value added reseller)

VAR partners combine products from a number of different vendors together with their own services to offer customers a complete and comprehensive solution.

VNF (virtual network function)

Implementation of a network function using software that is decoupled from the underlying hardware.

W

WDM (wavelength division multiplexing)

WDM expands the capacity of networks by allowing a greater number of signals to be transmitted over a single fiber. WDM enables numerous channels of data to be multiplexed into unique color bands, and then to be combined and transmitted over a single fiber and de-multiplexed at the other end.

Z

ZTP (zero touch provisioning)

When provisioning services and network functions CSPs are increasingly looking to reduce or eliminate the multitude of manual operations. Provisioning without manual intervention is called ZTP.

Corporate information

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ADVA on the web

More information about ADVA, including solutions, technologies and products, can be found on the company's website at www.advaoptical.com.

PDF files of this annual report, as well as quarterly reports, presentations and general investor information, are also located on the company's website and can be downloaded in both English and German. Quarterly conference calls are conducted on the day of earnings announcements. Related PDF, audio and transcript files are available for download in the investor relations section of the group's website, www.advaoptical.com.

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Wirtschaftsprüfungsgesellschaft, Munich, Germany

Legal counsels

Hogan Lovells, Munich, Germany

Tax advisers

Deloitte, Munich, Germany

Financial Calendar 2019

Publication of quarterly statement Q1/2019	April 18, 2019 Martinsried/Munich, Germany
Annual Shareholders' Meeting	May 22, 2019 Meiningen, Germany
Publication of Six-Month Report 2019	July 25, 2019 Martinsried/Munich, Germany
Publication of quarterly statement Q3/2019	October 24, 2019 Martinsried/Munich, Germany

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