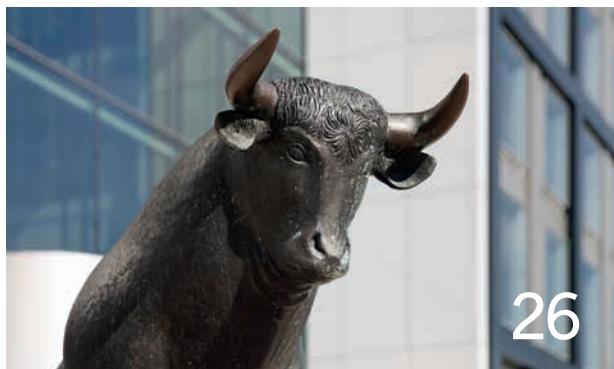


annual

On the year 2017 and prospects
for Deutsche Börse Group



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Dear readers,

For you, this is the third version of our “Annual”, the magazine that appears together with our financial report. For me it’s the first one in my new role, and I’m very happy to have the opportunity to introduce myself: my name is Theodor Weimer and I have been CEO of Deutsche Börse AG since 1 January 2018.

That having been said, this report isn’t about me – it’s about Deutsche Börse Group. In it, you’ll discover more about developments in 2017, and about the issues and projects that are important to us as a company. These include the fact that the UK will soon be leaving the European Union – an unprecedented event ([page 16](#)). We are playing our part in ensuring the transition on the financial markets is as positive as possible in our discussions with clients, regulators and politicians. While easier to plan for, the introduction of the Markets in Financial Instruments Directive and Regulation (MiFID II/MiFIR) also ushered in fundamental changes ([page 22](#)). Preparations for this dominated the sector throughout the year. Nor is the topic over yet, either for us or for our clients, since Brexit means that the rules will have to be updated.

As a company, we are aiming to – and will – grow; a short overview of our initiatives in this area is given on [page 8](#). This Annual also offers another glimpse behind the scenes on the financial markets: we asked market participants and experts what volatility is all about ([page 19](#)). The answers are extremely interesting. On a different note, the performance of the DAX® index attracted a lot of attention last year. We intend to use this interest to further boost capital-based investment in Germany ([page 14](#)).

To sum up, the direction we’re now heading in is the right one. Our clients support us. And now we also want to win back our reputation with the broader public – with you, our readers – and through deeds, not words. The impact we have on society is important to us. No company can or should ignore this in the long term. Our business activities are focused on our customers’ and investors’ needs – without losing sight of society as a whole. You have my word on that.

As you can see, at Deutsche Börse Group we do our jobs with a mix of deep conviction and the healthy distance needed for proper analysis. Our Annual aims to provide further proof of this. Do you have any feedback for us? Then please let us know by writing to corporate.report@deutsche-boerse.com.

I wish you an enjoyable read.

Yours sincerely,

Theodor Weimer

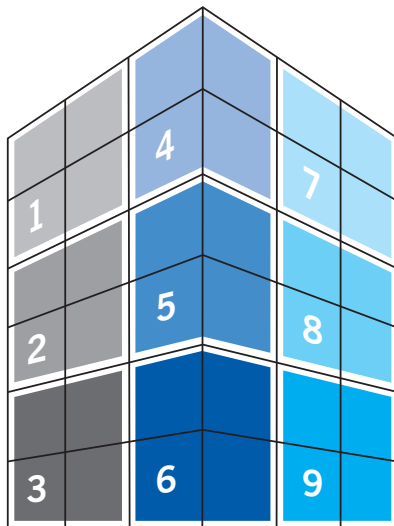
Theodor Weimer
Chief Executive Officer



STATUS – DEUTSCHE BÖRSE GROUP

Overview

Deutsche Börse Group is a diversified exchange operator whose products and services cover the entire value chain of financial markets. The Group’s business areas range from pre-IPO services through securities admission, trading, clearing and settlement, down to custody services for securities and other financial instruments, and collateral and liquidity management. Additionally, it provides IT services, indices and market data worldwide. We have assigned these products and services to the following nine groups:



- 1 Pre-IPO and listing
- 2 Trading
- 3 Clearing
- 4 Settlement
- 5 Custody
- 6 Collateral and liquidity management
- 7 Market data
- 8 Indices
- 9 Technology



1 Pre-IPO and listing

For start-ups, the crucial phase often comes when the business needs funding to make itself known on the market and to drive growth. Deutsche Börse launched its Deutsche Börse Venture Network® to help companies at this stage of their lives. The Group also invests in attractive fintech companies via its venture capital platform, DB1 Ventures. An initial public offering (IPO) is when a company goes public on the capital markets for the first time. Large and medium-sized enterprises, both from within and outside Germany, can raise equity and debt capital by listing on the Frankfurt Stock Exchange. Investors can share in the growth of the real economy – and can help facilitate it with the money they invest.

Our brands: Deutsche Börse, Börse Frankfurt, DB1 Ventures, Deutsche Börse Venture Network®

13 IPOs

on the Frankfurt Stock Exchange in 2017



2 Trading

Deutsche Börse operates regulated markets for equities, exchange-traded funds (ETFs), bonds, certificates, options and many other products via the Xetra®, Börse Frankfurt and Tradegate trading venues. Eurex® is a trading platform for derivatives, financial instruments based on other instruments (e.g. equities, indices, government bonds, currencies or commodities). They also include a large number of products of the EEX (European Energy Exchange) group, comprising not only energy (e.g. electricity) but also related products (e.g. emission allowances) and commodities (e.g. agricultural products). 360T operates a trading platform for financial instruments such as currencies, money market products and interest rates.

Our brands: Börse Frankfurt, Eurex®, Eurex Repo®, European Energy Exchange, Tradegate, Xetra®, 360T®

€20.6 trillion

cleared volumes across all derivatives, securities and repo transactions via Eurex Clearing (gross monthly average in 2017)



3 Clearing

Eurex Clearing AG, European Commodity Clearing AG and Nodal Clear, LLC – Deutsche Börse Group's clearing houses – minimise default risk by acting as partners for all buyers and sellers. This reduces our clients' exposure and hence leverages financing and capital efficiencies. These benefits – coupled with the regulatory goal of settling more business via central counterparties (CCPs) – mean that using CCPs for clearing is also a stability factor and a core component of the financial sector. Deutsche Börse Group offers efficient clearing of derivatives, securities and securities financing transactions, as well as of currency and commodities transactions.

Our brands: Eurex Clearing, European Commodity Clearing, Nodal Clear



4 Settlement

Settlement comes after trading and clearing, and ensures that the individual positions are recorded correctly and that cash is exchanged for securities. In addition, it ensures that the individual client securities accounts are credited. Clearstream, Deutsche Börse Group's post-trade services provider, is responsible for the efficient global settlement of securities transactions.

Our brands: Clearstream, LuxCSD, REGIS-TR



5 Custody

Once they have been correctly settled, assets are held in custody. Clearstream manages them for the entire time they are held in custody and offers services, which include performing corporate actions and making dividend payments, for all types of securities. In addition, end-to-end reporting and ring-fencing of deposited collateral allow market participants to meet their regulatory obligations efficiently.

Our brands: Clearstream, LuxCSD

Global Securities Financing
(average outstanding volume for 2017):

€**459.8** billion



6 Collateral and liquidity management

The Global Funding and Financing (GFF) business segment integrates Deutsche Börse Group's entire range of services for securities financing, cash funding and collateral management. This aligned service offering allows the Group to serve the growing needs of its clients in the areas of trading as well as risk and liquidity management as efficiently as possible.

Our brands: Clearstream, Eurex Clearing, Eurex Repo®



7 Market data

Institutional and private investors need timely and precise information to be successful on the markets. Deutsche Börse supports its customers with real-time data feeds, price data, order book figures and index levels from its own trading systems and those of its partners. It also provides market participants with historical data. The offering is completed by an innovative analytics and metrics portfolio which enables investment and trading strategies based on big data analyses and machine learning.

Our brand: Deutsche Börse



8 Indices

STOXX Ltd. is the operator of Deutsche Börse Group's index business and a global provider of innovative, tradeable index concepts. STOXX develops and disseminates indices that track markets around the world. Its index families cover all countries, regions and sectors as well as all investment themes and strategies. The Group's blue-chip indices include the EURO STOXX 50® index and the DAX® index, which track the performance of the 50 industry-leading companies in the eurozone and Germany's 30 largest companies, respectively.

Our brands: DAX®, STOXX®

12,422
calculated indices by STOXX



9 Technology

Information technology is one of the main factors driving competitive advantage during the development and operation of our product portfolio. Deutsche Börse Group operates platforms along the entire capital market value chain, focusing on security, integrity, efficiency and innovation.

Our brands: Deutsche Börse,
7 Market Technology®: C7®, F7®, M7®, N7®, T7®

Our Supervisory Board and Executive Board

OUR SUPERVISORY BOARD

SHAREHOLDER REPRESENTATIVES

Joachim Faber, *1950

Chairman

Independent Management Consultant, Grünwald

Nationality: German

Richard Berliand, *1962

Deputy Chairman

Independent Management Consultant, Lingfield,

Surrey

Nationality: British

Ann-Kristin Achleitner, *1966

Scientific Co-Director

Center for Entrepreneurial and Financial Studies

(CEFS) at the Technische Universität München (TUM),

Munich

Nationality: German

Karl-Heinz Flöther, *1952

Independent Management Consultant, Kronberg

Nationality: German

Craig Heimark, *1954

Managing Partner

Hawthorne Group LLC, Palo Alto

Nationality: US-American

Monica Mächler, *1956

Member of different supervisory bodies,

Pfäffikon

Nationality: Swiss

Erhard Schipporeit, *1949

Independent Management Consultant, Hanover

Nationality: German

Amy Yip, *1951

Partner

RAYS Capital Partners Limited, Hong Kong

Nationality: Chinese (Hong Kong)

EMPLOYEE REPRESENTATIVES

Marion Fornoff, *1961

Staff member in the section People

Relations & Employee Engagement

Germany, Switzerland, Czech

Republic & USA

Deutsche Börse AG,

Frankfurt/Main

Nationality: German

Hans-Peter Gabe, *1963

Staff member in the section Performance & Compensation, People Analytics

and Learning

Deutsche Börse AG,

Frankfurt/Main

Nationality: German

Jutta Stuhlfauth, *1961

Lawyer, M.B.A. (Wales)

Staff member in the department

Group Organisational Services

Deutsche Börse AG,

Frankfurt/Main

Nationality: German

Johannes Witt, *1952

Former staff member in the department

Financial Accounting & Controlling

Deutsche Börse AG,

Frankfurt/Main

Nationality: German

OUR EXECUTIVE BOARD



Theodor Weimer, *1959

(since 1 January 2018)

Chief Executive Officer



Andreas Preuss, *1956

Deputy Chief Executive Officer

and responsible for IT & Operations,

Data & New Asset Classes



Gregor Pottmeyer, *1962

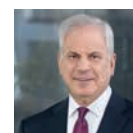
Chief Financial Officer



Hauke Stars, *1967

responsible for Cash Market,

Pre-IPO & Growth Financing



Jeffrey Tessler, *1954

responsible for Clients,

Products & Core Markets

FORMER MEMBER OF THE EXECUTIVE BOARD

Carsten Kengeter, *1967

(until 31 December 2017)

Chief Executive Officer



Marriott

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STATUS – OUR YEAR 2017

Growth and innovation

It goes without saying that 2017 was the year in which Deutsche Börse Group had to overcome the fallout from the failed merger with the London Stock Exchange Group and to institute a change of management. This took a great deal of time and attention. And yet 2017 was anything but a period of stagnation – on the contrary, we completed a number of major strategic projects and drove forward new ones. All in all, 2017 was a year in which we set course for the future across all our divisions.

We aim to provide our customers with a secure framework for their operations and with reliable products and services – especially given current developments in Europe. For example, at the beginning of 2018 the new Markets in Financial Instruments Directive II (MiFID II) resulted in radical changes to market structures. And the fact that the consequences of Brexit are still unclear means that market participants are now having to plan for a variety of different scenarios: from an ami-

cable agreement setting out orderly economic relations down to a breakdown in the negotiations between the European Commission and the United Kingdom.

To ensure that customers can meet the new MiFID II and the European Market Infrastructure Regulation (EMIR) transparency requirements reliably, easily and efficiently, we have bundled and expanded our offerings in this area in our **Regulatory Reporting Hub**.



This continues our proven role as an intermediary between the market and the regulators. The German Federal Financial Supervisory Authority, BaFin, has confirmed that both our reporting mechanism and our publication system meet the regulatory requirements. The Hub is clearly finding favour among market participants – as can be seen from the high number of institutions that are using this offering.

The future of **euro clearing** once the United Kingdom has left the EU is another concern for our customers. We can offer them a smooth transition here. For example Eurex Clearing, a Deutsche Börse Group company that is one of the world's leading central counterparties, is working together with major market participants and trading platforms for OTC interest rate swaps to further enhance their price transparency and price quality. The joint aim is to create an alternative liquidity pool for clearing of interest rate swaps within the EU-27. You can find more information on our Brexit transition offerings in the [chapter entitled "Brexit – a historic decision and its implications"](#).

The most important infrastructure project last year was migrating European securities settlement to **TARGET2-Securities (T2S)**. Clearstream, our central securities

depository, supported this initiative by the European Central Bank from a very early stage onwards. In 2017, as part of the fourth and largest wave of migration to T2S, Clearstream successfully moved the German and Luxembourg markets on to this pan-European settlement platform. The company now offers its customers centralised access to the T2S market and other international markets. This allows market participants to reduce the complexity and cost of market access.

Clearstream now offers centralised access to the T2S market and other international markets.

Another key post-trading business performed extremely well in the past year: Clearstream's **fund services** saw transactions and fund assets under custody increase by double-digit percentage rates. Among other things, we offer a centralised access point for funds, allowing orders to be routed electronically to transfer agents. This saves our customers money. Our goal is to put the fund market on a par with other securities markets as regards automation, settlement security, and traceability.

Talking about “other securities markets”: since March 2017, Xetra trading on the Frankfurt Stock Exchange has used Deutsche Börse Group’s **T7® trading technology**. This means that the systems for the Xetra (cash market) and Eurex (derivatives market) trading venues have been harmonised. Investors and listed companies now have a forward-looking system at their disposal that has already established a track record with a number of international exchanges: among other places, our T7 technology has been in operation for some time at the European Energy Exchange (EEX), the Helsinki Stock Exchange and BSE (formerly the Bombay Stock Exchange).

T7 now reduces latency for cash market orders as well.

Using T7 reduces latency – i.e. the time taken by the system to process an order. Harmonising the technology used on the Xetra and Eurex platforms generates synergies and cuts development and maintenance costs for participants who are active on both markets. This means that, for example, Eurex trading participants can access Xetra more easily. In addition, the trading system can be upgraded more rapidly and efficiently to accommodate regulatory requirements and technical enhancements.

But trading was not the only place where advances were made in 2017 – the same also applies to the IPO market. In March, Deutsche Börse Group launched a new exchange segment for small and medium-sized enterprises (SMEs), **Scale**, in order to facilitate their access to the capital markets. Scale stands for our aim of expanding the current corporate finance ecosystem. It is our answer to the massive investments SMEs

need as they have to adapt their business models to digitisation, the fourth industrial revolution. The beneficiaries are companies with proven business models that already have proven track records with investors.

One of Deutsche Börse’s key strengths is its broad range of tradeable asset classes. As in previous years, we expanded our business in new, rapidly growing asset classes in 2017. The best example of this was the takeover by EEX of **Nodal Exchange**, a US-based energy exchange. The acquisition marks our entry on to the North American energy market, allowing us to expand our global member base. Nodal Exchange offers a large number of electricity and natural gas contracts designed to hedge against price risk in the US. This is enabling us to expand our trading and clearing portfolio even further and to meet our customers’ needs across a wide range of markets and geographical regions.

While our projects to date have expanded and modernised our existing offering, the digital transformation of the financial sector marks a fundamental paradigm shift. Artificial intelligence (AI), blockchain technology and big data will change our services to an extent last seen in the 1990s, when automated trading was introduced. The entire exchange industry is affected. We intend to be among the pioneers and beneficiaries of progress in this area and to build on our role as a leading-edge technology provider. This is why we set up a Content Lab in 2017 that is using data science techniques to prepare for the next step in technological evolution.

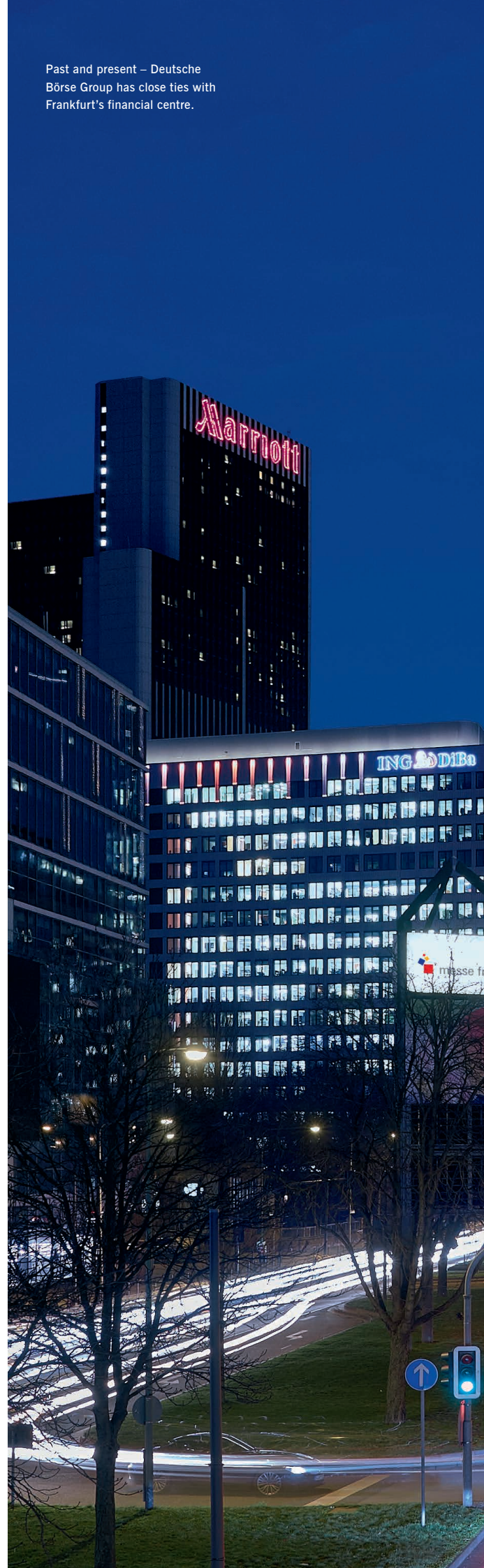
We are the first to have developed a true **blockchain** model with a central bank: together with Deutsche Bundesbank, we unveiled a securities settlement prototype based on this technology. Two other highly

promising prototypes for clearing and collateral management are currently under development. For example, we have launched a global blockchain technology initiative designed to simplify cross-border handling of securities collateral. The central securities depositories in Canada, Luxembourg, South Africa and Norway are taking part in the project. Our third blockchain project involves a collateralised digital currency known as “collateral coin”. This allows Eurex Clearing, our central counterparty, to mitigate the credit risk associated with transferring digitalised commercial bank money. In addition, this new concept could be used to improve the efficiency of our post-trading services thanks to the interface between Eurex Clearing and Clearstream.

AI and blockchain technology will change our services as radically as automated trading did before them.

Deutsche Börse is not just a profitable and reputable company that contributes significantly to the stability of the European capital market. It is also focused squarely on the future and is helping shape the radical change that the process of digital transformation has unleashed on the financial services sector. We will enhance our strategy in the coming months – and by doing so will strengthen not just our company but also Frankfurt’s role as a financial centre as well as Germany and Europe as business locations. ✕

Past and present – Deutsche Börse Group has close ties with Frankfurt’s financial centre.





RESPONSIBILITY – ECOSYSTEM FOR GROWTH

5 thoughts on Germany's share ownership culture

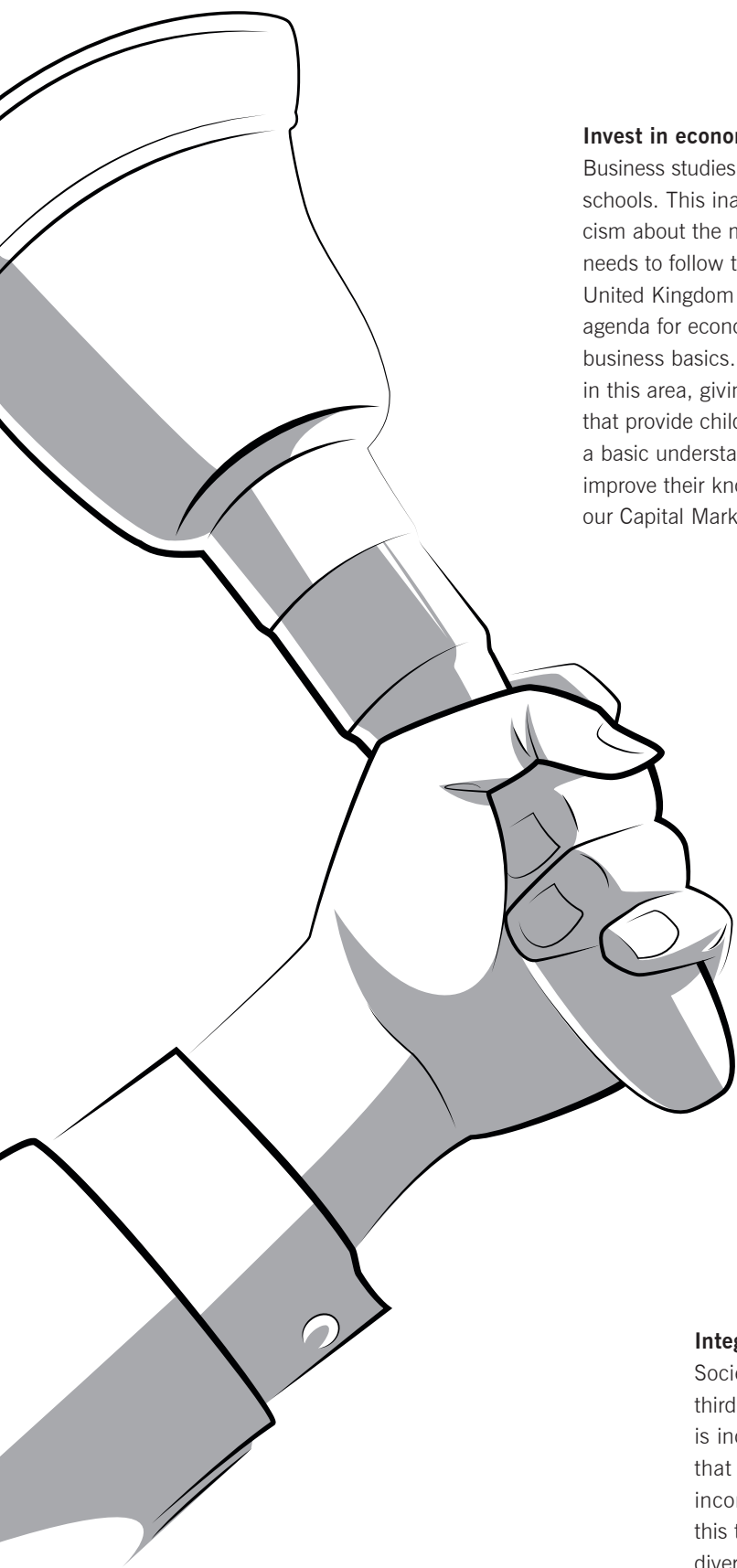
The capital market and share culture in Germany is underdeveloped. The European Union's largest economy is flourishing and offers opportunities for investors. But how can these be used?

Provide a strong ecosystem for start-ups

A total of 13 companies took the plunge in 2017 and went public on the Frankfurt Stock Exchange. In order for more firms to benefit from this kind of financing, Germany needs a strong ecosystem for growth that allows young companies to develop to the point at which they are ready to list on the stock exchange. Although the Federal government in recent years has encouraged a number of measures designed to improve the situation for start-ups, Germany has lagged behind other countries. Tax breaks for young companies, more extensive use of special funds, grants for young entrepreneurs and support programmes would further strengthen the ecosystem for start-ups in Germany. At the same time, institutional investors need easier access to the venture capital market. Deutsche Börse Venture Network® supports young growth-stage companies, providing a platform for 175 qualified companies to meet roughly 300 national and international investors (as of December 2017). With it, Deutsche Börse AG has created a comprehensive ecosystem whose member companies have closed financing rounds worth approximately €1.3 billion since the platform was launched, and which has already led to four IPOs.

Facilitate access to the capital market for SMEs

The 2008 financial crisis led to a large number of rules and regulations designed to make the financial markets more secure and more stable. The strict conditions that have to be met before a company can go public and the post-listing obligations are important – but at the same time they discourage many small and medium-sized enterprises (SMEs) in particular from floating. However, this is a basic step in the capital-raising process. Revising current regulations for SMEs, and in particular introducing prospectus simplifications for listings on the regulated market, could make listing a much more attractive proposition for these companies. On 1 March 2017, Deutsche Börse launched Scale – a segment that makes it easier for SMEs to raise finance on the capital market.



Invest in economic education

Business studies are not normally a compulsory subject at German schools. This inadequate education on the topic leads to scepticism about the market economy and entrepreneurship. Germany needs to follow the lead of other countries such as Australia, the United Kingdom and the Netherlands and introduce a national agenda for economic education that teaches macroeconomic and business basics. Deutsche Börse supports a number of initiatives in this area, giving presentations and providing learning materials that provide children and young people of (almost) all ages with a basic understanding of the stock exchange. Retail investors can improve their knowledge of investments at the seminars run by our Capital Markets Academy.

Create more incentives for private wealth creation using equities

In 2016, 14 per cent of Germans owned shares or fund shares – a much lower figure than in other countries. Many come into contact with equities for the first time in the context of share ownership programmes offered by their employers. An increase in the tax allowance on employee share ownership, which is relatively low at present by international standards, would offer additional incentives to select this asset class. Since 2009, share purchases have been taxed at both company and investor level; the total amount levied is almost 50 per cent. Reducing the tax on part of the income from shares would reduce this double taxation.

Integrate more shares in retirement provision

Society is getting older. Taxes already account for around one-third of the financing for statutory pensions today – and this trend is increasing. Private retirement provision using an asset class that offers an appropriate return will give people an adequate income after they retire. In today's low-interest environment, this type of income can be generated from shares using a broadly diversified portfolio and a long-term investment horizon. Government support for share-based asset accumulation would make a decisive contribution to preventing old-age poverty: measures such as tax incentives for long-term asset accumulation would facilitate this goal. ✕

AMBITION – BREXIT

A historic decision and its implications

Brexit, and the insecurities connected with it, present a major challenge for financial markets all over the world. Market participants have to Brexit-proof their businesses – not an easy task.

On 23 June 2016, the UK electorate voted by a small majority that the country should leave the European Union. The day after this historic Brexit vote, Europe's financial markets faced a serious test: due to this unexpected news, trading saw phenomenally high volatility (see the chapter entitled [☞ “Volatility – applying maths to the markets”](#)). Volatility interruptions and risk management by central counterparties helped keep the systems stable. Eventually, the markets coped – but this was only the start of the issues they face.

MANY POSSIBLE SCENARIOS

The biggest problem is uncertainty. The EU intends to finalise negotiations with the United Kingdom by October 2018 to allow sufficient time for ratification. But market participants cannot wait for the outcome of these talks: they must be ready much earlier. And this means they have to prepare for all possible scenarios.

Deutsche Börse Group has set up a dedicated Brexit Transition Team to help these companies master these



challenges. The team works together with the clients to assess the potential impact on their businesses and the feasibility of their options. It helps them implement their Brexit strategies according to their specific needs, addressing problems and solutions along the entire value chain. Clients profit from having a single point of contact to discuss all transition needs and queries relating to Deutsche Börse Group.

SEARCHING FOR SOLUTIONS

Uncertainty is particularly strong in the areas of trading and clearing. The EU's trading laws ensure flexible cross-border trading throughout the European Economic Area. The markets in the remaining 27 EU member states and the United Kingdom are closely interlinked. The United Kingdom currently acts as a wholesale hub for other European financial centres, accounting for up to 80 per cent of EU financial market activity in several segments. The exit of a major European economy threatens this highly interconnected system. Market participants cannot afford to build their businesses on uncertainty. UK-based market participants have to ensure they can continue doing business throughout the 27 remaining member states and, thus, many of them are searching for alternatives outside the country.

The second key area, clearing, is facing similar challenges. Currently, over 95 per cent of euro-denominated interest rate swaps are cleared in the United Kingdom. To ensure a resilient European financial marketplace, the European co-legislators are considering the policy regarding the future clearing location at the suggestion

of the European Commission. One of the key questions is whether the UK – once it has left the EU – will still be an appropriate venue for handling almost all clearing of euro-denominated interest rate swaps. Regardless of the outcome of this review, there is already growing demand for continental European CCP clearing solutions.

Deutsche Börse's Eurex Clearing operates a business model based on state-of-the-art technology and risk management systems. In October 2017, the clearing house launched a partnership programme designed to further accelerate development of a liquid, EU-based alternative for clearing interest rate swaps. The company is cooperating with major market participants and execution platforms for OTC-traded interest rate swaps to enhance price transparency, price discovery and liquidity. The programme quickly gained broad market support with participants drawn from the UK, continental Europe, the US and Asia.

THE YEAR OF IMPLEMENTATION

2017 was the year for taking decisions: after analysing the status quo and evaluating potential scenarios and their implications, most financial institutions have now adopted their Brexit strategies. 2018 is the year to put their planning into concrete action. By the expected Brexit in March 2019, their business models must have been set up, tested, ported and approved. Deutsche Börse Group and its Brexit Transition Team are supporting their clients every step of the way – so as to be ready for changes to come. ✕



INNOVATION – SUSTAINABILITY IN THE FINANCIAL SECTOR

Securing our future

Kristina Jeromin, Head of Group Sustainability, talks about different approaches that can change the finance sector in the long term.

What has the financial sector got to do with sustainability?

KRISTINA JEROMIN: A great deal! It's just that the sector hasn't focused enough on this topic for many years. Deutsche Börse Group's core business is organising capital markets that provide stability, integrity and transparency. Our work helps ensure that the market economy remains viable in the future – and this depends crucially on concepts for sustainability. Capital has to be allocated internationally using the same principles, too. Among other things, there is a need to drive forward major changes such as the shift to a new energy system or the digital transformation of the economy – changes which need funding. Business models that are not sustainable entail risks, and these need to be identified and managed. However, this also offers a major opportunity to develop innovative concepts that can be used to do business successfully in the future as well.

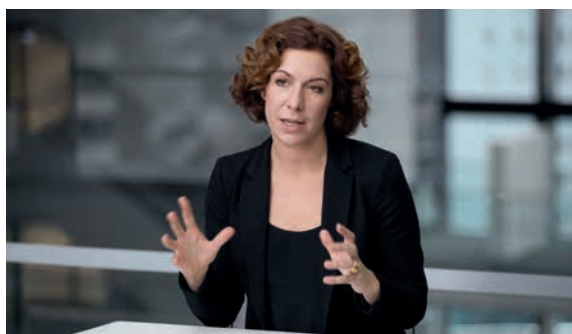
What role does the Group Sustainability Board play?

KRISTINA JEROMIN: It thinks sustainability – and integrates it along Deutsche Börse Group's entire value chain. Every company has to ask itself what impact its business has and how it can address this issue responsibly. Our Group Sustainability Board examines the contribution made to our sustainability performance by each area of responsibility and what we can do to improve. The opportunities and risks that it identifies affect both our sustainability profile as a DAX company and our role as a public-service organisation operating capital markets.

What are the concrete goals of the Accelerating Sustainable Finance initiative?

KRISTINA JEROMIN: We are currently facing massive structural changes. No exchange operator, regulator or bank can manage them alone – we all have to work together here. Doing business sustainably does not mean being financially unsuccessful. On the contrary, we want to ensure that we're all still earning money with our core businesses 50 years from now. That's

why we mobilised the players in Frankfurt's financial centre, and signed the Frankfurt Declaration – together with the other companies and institutions active in this area – at the conference held to launch the initiative. We aim to use it as a basis for jointly establishing new capital market structures and for putting sustainability at the heart of everything we do. Our goal is to differentiate ourselves as a financial centre from our international rivals and to ensure that we remain competitive in the long term.

**Where can Deutsche Börse still improve its sustainability performance?**

KRISTINA JEROMIN: In all business areas. For me, the Accelerating Sustainable Finance initiative is a chance to cater even more specifically to market participants' needs. Why not create a separate segment or give preferential treatment to trading in sustainable products – why not create positive incentives, in other words? Promoting impact investing is another example. Achieving the United Nations' Sustainable Development Goals is the largest infrastructure project of our time. We need sustainable financing strategies for this. Investors have a big responsibility. The idea that, in the long term, it's just not worth investing in products that aren't future-friendly must continue to gain ground. It's not enough to think in terms of three- to five-year risk horizons; what we need are ideas about how to deal with the situation 15, 20 or 25 years from now – we need to be prepared for the future it's clear we'll be facing. ✕

STATUS – TURBULENT MARKETS

Volatility – applying maths to the markets

“Low volatility” is a hot topic in investor forums and the business press. But care is needed when mathematical expressions suddenly become fashionable. Imprecise definitions take hold quickly and are hard to get rid of.

Basically speaking, volatility measures the extent to which values deviate from a calculated mean. In a stock market context, it expresses how much prices vary over a given period of time. Stock market volatility is said to be low when prices are closely dispersed around the mean. In contrast, volatility is high when the mean and the prices of the shares traded differ substantially.

PROFESSIONALS MAKE THE MARKETS

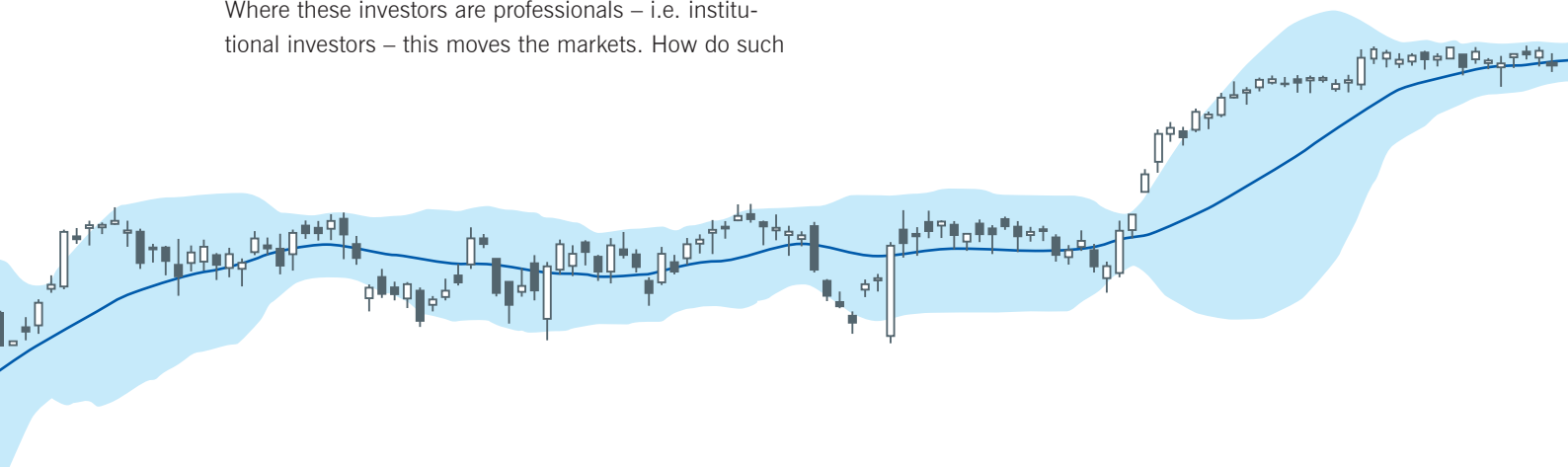
How do such deviations in prices come about? Market participants have different expectations, and these are reflected in different prices. Doubts and uncertainties increase volatility, since investors are guided by their own personal ideas of what the future will bring.

Where these investors are professionals – i.e. institutional investors – this moves the markets. How do such

medium- and long-term stock market movements and relatively isolated variations in prices fit together? “Professional traders depend on deviations in prices to enter and exit the market – for example by setting price limits”, explains Oliver Roth, Head of Specialist Floor Equities Trading at Oddo Seydler Bank. “Investors need a certain level of volatility in order to be able to invest in trends, especially where these are long-term.”

ONE EVENT, DIFFERENT OUTCOMES

In other words, a high level of volatility triggers a variety of different actions by market participants. Some hedge their positions, while others buy and sell stocks. Increasingly, trades are made at different prices, which in turn



attracts new market participants. Trading increases and market participants with different goals and preferences find attractive opportunities, and the market becomes more and more liquid and diverse as a result.

This environment offers traders good openings for entering and exiting the market, which also increases trading volumes. “Nevertheless, volatility isn’t actually mainly about trading volumes”, says Oliver Roth. “Large deviations in prices don’t affect the trading volumes for major investors’ portfolios in the short term”. Short-term in this context can be defined as a few days. “However, after four weeks or so we do see them impacting volumes for these market participants, too, as traders adapt their portfolios to market conditions”, says Roth.

HISTORICALLY LOW IMPLIED VOLATILITY

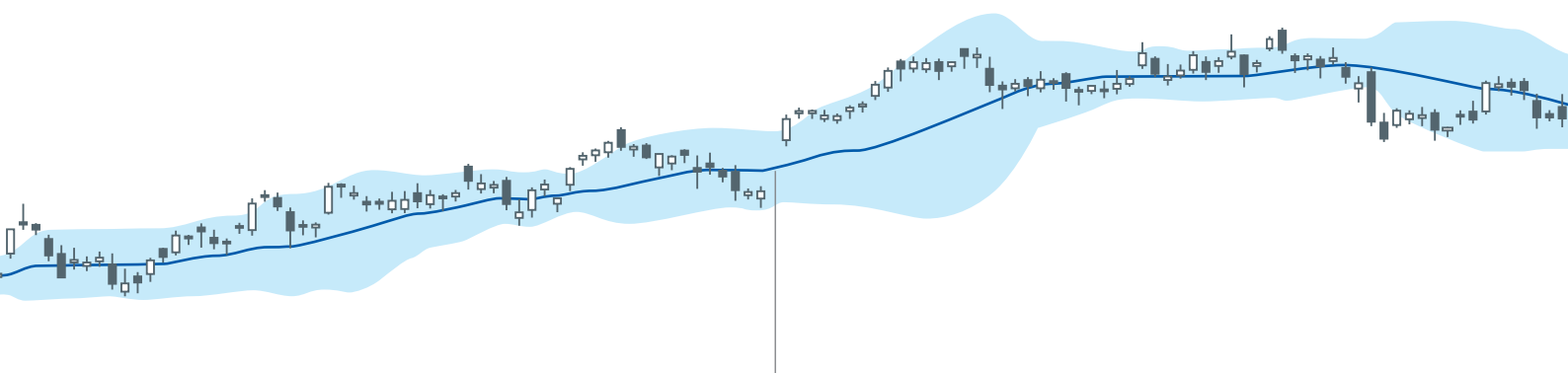
Market volatility was at a historically low level in 2017. “Implied volatility indices – such as Deutsche Börse Group’s VSTOXX – recorded readings reaching below 11 per cent or so for the eurozone in 2017”, says Zubin Ramdarshan, Head of Derivatives Product R&D Equity and Index at the Eurex derivatives exchange. “Also noteworthy is that these historical lows are happening in a stock market that is hitting all-time highs. To this extent, the low VSTOXX also reflects the strong overall uptrend in the market, which is not seeing large reversals or downturns.” Still, not every trader and not every type of transaction was affected by this low volatility. As trader Oliver Roth says: “In the field where I work I can definitely see sufficient

volatility in a rising market. In the short term there were always prices that deviated sufficiently from previous levels to let investors enter the market.”

Yet even if traders and markets adapt quickly to the new situation, the low level of volatility seen in 2017 remains unusual. Zubin Ramdarshan has the following explanation: “I do think there’s a level of volatility that can be regarded as ‘normal’, although this is a purely theoretical figure”, he says. “Use a different time frame and you’ll get a different mean. And yet I’d say that in recent decades typical – what I would call ‘normal’ – volatility on the European stock markets has been between 20 and 30 per cent, while in the US it has been between 15 and 25 per cent.”

A CLUSTER OF CAUSES

What, then, lies behind the extremely small fluctuations in prices seen last year? “I see the main drivers as two influential participants who are both relatively new to the market”, says Zubin Ramdarshan. “These are the central banks, which are purchasing bonds and other financial instruments on the one hand and ETFs on the other. Every market retracement in 2017 typically attracted further ETF inflows in a “buy-the-dip” strategy. So the upward trend in equities remained intact and realised volatility was consequently



The volatility curve

The moving average curve links the closing prices of several trading days.

subdued.” Finally, new trading styles based in some cases on innovative technologies are also preventing major price fluctuations. “Positions are now closed out earlier than they used to be – sales and purchases are made very quickly once a change in prices becomes apparent. This means that even major waves of stock market selling lasted just a few days in 2017”, he adds.

NO CAUSE FOR CONCERN

“We haven’t seen any long-term downturns in market prices despite dramatic political events and elements of uncertainty”, is how Oliver Roth sums up the situation. “The markets are working – for both retail investors and professional traders. That’s good news.”

Zubin Ramdarshan echoes this assessment. “Contrary to popular opinion, extremely high levels of volatility are not inherently good for stock exchanges, which operate the markets.” He is convinced that “high levels of volatility only lead to higher levels of trading in the short term. In the medium term the opposite is true: extreme volatility frightens traders, who then close out their positions.”

THREE VOLATILITY CONCEPTS

Historical volatility: This is the standard deviation of actual values from a calculated moving average; the latter can be modelled as a curve or a straight line.

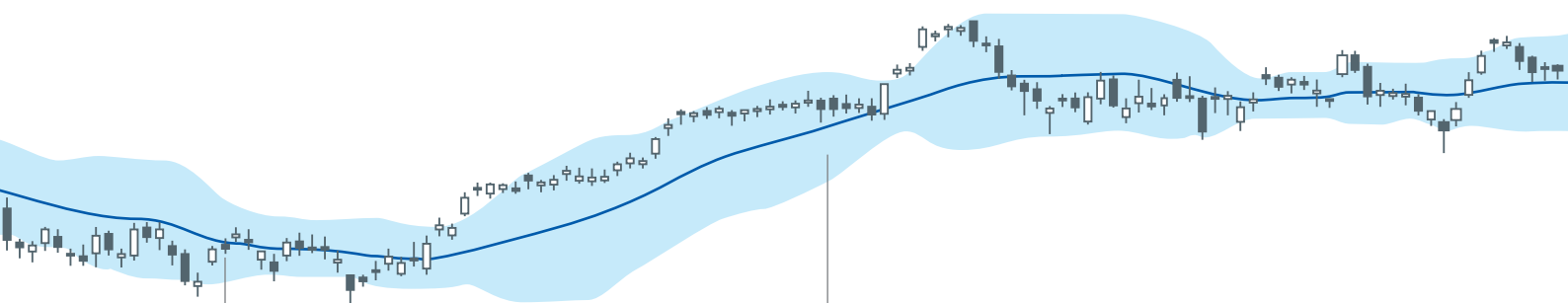
Intraday volatility: This is calculated using the prices at the start and close of trading, along with daily peaks and troughs.

Implied volatility: This uses a sophisticated model applied to option prices to depict market expectations.

VOLATILITY – INDICES

STOXX, a subsidiary of Deutsche Börse Group, offers a series of volatility indices. Implied volatility has become an important indicator on which to base products.

This didn’t happen in 2017. For Ramdarshan, the glass is half-full, not half-empty: “Although trading volumes were down slightly at the end of the year, the level of open interest remained intact – and in fact increased.” As an exchange operator, Deutsche Börse cannot influence this directly, though it does facilitate and support liquid markets by providing an extremely broad-based, diversified order book. This gives as many clients as possible attractive opportunities to trade within a wide spectrum of products. ✕



The so-called **Japanese candle sticks** show the range between opening and closing price within one day. White candles imply growing prices, black candles falling ones.

The **Bollinger bands** denote the standard deviation around the moving average.



INNOVATION – REGULATORY UPDATES

The year of MiFID II and MiFIR

The revised Markets in Financial Instruments Directive (MiFID II) and the regulation MiFIR put the provision of securities services for a large number of financial instruments on a new footing. They aim to protect investors by enhancing the transparency and stability of the financial markets. Deutsche Börse Group supports these goals – and its customers: we help them meet regulatory requirements efficiently. And we do this by working closely together with them and the regulators to develop adequate solutions.

The preparations for the introduction of MiFID II had been going on for a long time, and dominated events last year. What would this time have looked like in tweets?



Possibly something like this:



Deutsche Börse Group @DeutscheBoerse
12 Jun 2014
Published in today's EU Official Journal: [#MiFIDII](#) [#MiFIR](#) are coming! Goals: more transparency, stability and improved investor protection.



Eurex @EurexGroup
11 Dec 2017
Bye-bye phones! [#EurexEnLight](#) allows transparent, [#MiFIDII-compliant](#) OTC pricing using an innovative electronic platform. www.deutsche-boerse.com/eurex-enlight



Eurex @EurexGroup
11 Nov 2016
International workshop tour completed successfully. More than 300 attendees informed personally about timing and impact of [#MiFIDII](#).



Deutsche Börse Group @DeutscheBoerse
3 Jan 2018
[#MiFIDII](#) [#MiFIR](#) reporting now possible via the [#RegulatoryReportingHub](#), our end-to-end solution for regulatory reporting. www.deutsche-boerse.com/en/regulatory-reporting



Deutsche Börse Group @DeutscheBoerse
15 May 2017
Markets preoccupied by [#Brexit](#). Will changes also have to be made to [#MiFIDII](#)? Our Brexit Transition Team can help you. www.deutsche-boerse.com/en/brexit-transition



Deutsche Börse Group @DeutscheBoerse
4 Jan 2018
[#MiFIDII](#) [#MiFIR](#) went live yesterday. Thanks to everyone for a job well done. Next stops: [#Brexit](#) [#CapitalMarketsUnion](#)



Xetra @Xetra
25 Sep 2017
Beta testers wanted! Test the new release of our [#T7](#) trading system in a simulated environment – also for [#Eurex](#). Fully enabled for [#MiFIDII](#).

For further information about a broad range of supervisory topics, see www.deutsche-boerse.com/regulation

STATUS – WORKING AT DEUTSCHE BÖRSE GROUP

Diversity and change – a perfect blend

A total of 5,640 employees with 85 different nationalities work for us at 39 locations. Are they all business studies graduates? Not in the least! Their **educational backgrounds** are as diverse as they are themselves: we have everybody from philosophers through physicists down to office communications and IT specialists working for us.

The Group offers employees a number of **benefits** designed to make their working lives easier. “Job tickets” for use with public transport, meal allowances as well as contributions to gym memberships and private retirement provision offer different target groups the support they need in their daily work.

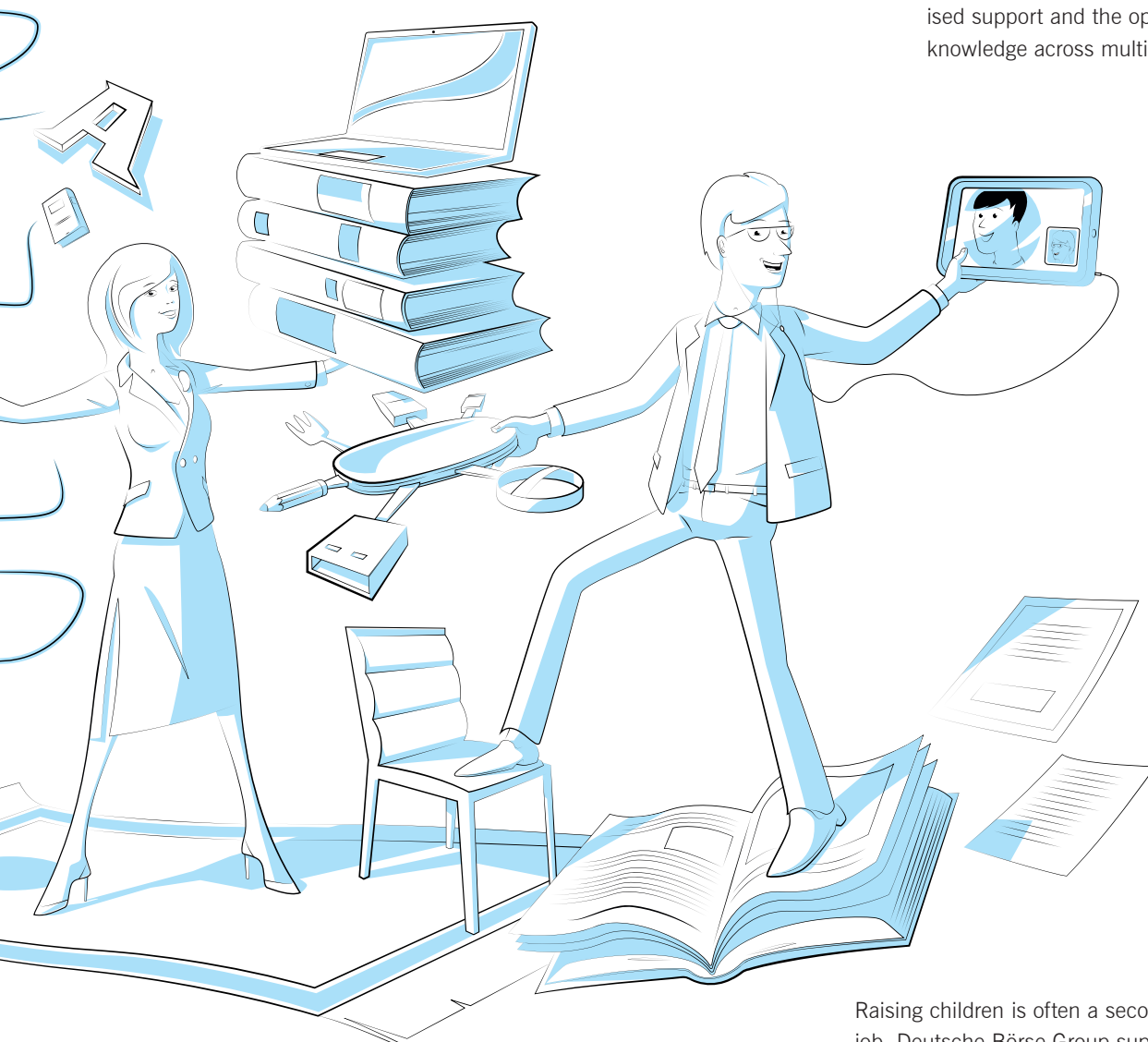
The “Match & Exchange” platform promotes **knowledge transfer** and cooperation across departmental boundaries. To date, the platform counted 43 offers to find suitable project partners, spend a couple of days finding out what it’s like to work in another area or share their expertise with colleagues. Our mentoring system for new colleagues, our lunch dating networking tool and the Lunch-time Forum, which is designed for information sharing, also all help promote cooperation and communication.

Our **marketPride** network serves as a contact point for gay, lesbian, bisexual, transgender, intersex and queer colleagues – and for everyone else too, of course. It is active in five Group locations and has more than 100 members.



Employees spend an average of 3.3 days per year on **professional development**. Personalised training opportunities increase the efficiency and effectiveness of individual employees and hence of the Group as a whole.

We **foster talent**: the “Evolving Leaders” programme prepares potential managers for their future role. And our “Show your talent” initiative offers room to develop and implement exciting new ideas, including customised support and the opportunity to share knowledge across multiple areas.



Two entire areas are currently piloting a state-of-the-art **working environment**, complete with new technology, that has been specially developed for Deutsche Börse Group. Here, the office becomes part of the team: it is agile, mobile and innovative.

Raising children is often a second full-time job. Deutsche Börse Group supports employees by subsidising **childcare**, offering flexible working times, and enabling staff to work from home. And if an acute problem arises, parent/child offices or emergency childcare are available to help at many Group locations.

Deutsche Börse Group's
headquarters in Eschborn



AMBITION – OPPORTUNITIES AND EXPECTATIONS

Our take on the future

Deutsche Börse Group generated solid earnings in 2017. At the same time, it launched a wide range of initiatives designed to increase its chances of further growth in coming years (see also [the chapter entitled “Growth and innovation”](#)).

Our goal is to continue expanding our market share, assisted by relevant regulations, yet above all by providing compelling, efficient offerings. In particular, we want to strengthen on-exchange solutions in areas previously dominated by over-the-counter (OTC) models.

EUROCLEARING IN FRANKFURT

Our clearing offering for euro-denominated interest rate swaps (euroclearing), for example, received a significant boost in 2017 thanks to our partnership programme. All in all, this service met with extremely positive feedback in 2017. It attracted a large number of major banks and market participants and achieved impressive average daily clearing volumes of €35 billion in January 2018. Although London still dominates this market, we provide participants with a credible European alternative. Our euroclearing offering is market-driven and, given the impending departure of the United Kingdom from the European Union, it also has political backing and is necessary from a regulatory perspective.

PROSPECTS FOR INCREASING OUR MARKET SHARE

There are other growth opportunities as well, such as in the commodities sector: after the announced break-up of the joint German-Austrian power price zone initially impacted business in 2017, the European Energy Exchange (EEX) introduced separate electricity futures for Germany and Austria. These have now become the benchmark for European power trading.

Foreign exchange (FX) represents another opportunity. Following the introduction of our electronic 360T® trading platform, 2018 will see the end-to-end automation of FX trading and expanded clearing functionality. Both are innovations in an established market that we are now taking to the next level. Clients will have access to even more efficient, up-to-the-minute and secure solutions for FX trading. In a segment still dominated by OTC trading, demand is growing for transpar-

ent, multi-bank electronic trading venues. 360T is setting standards for the entire market here.

The funds business will also see further growth, with our goal here being to gain new clients and additional issuers in order to make our unique service offering for the entire range of funds even more attractive. The index business is experiencing widespread innovation in a highly dynamic market. New indices, based for example on artificial intelligence (AI), will allow us to handle greater volumes. This brings us to the key issue of new technologies – an area where we shall focus on driving forward developments in 2018, e.g. in the field of big data.

EFFICIENT OFFERINGS FOR A RADICALLY CHANGING EUROPE

Deutsche Börse Group constantly adapts its offerings to meet client needs and regulatory requirements, and to leverage the opportunities offered by new technologies. We expect these initiatives to generate additional revenue for us in 2018. In the area of securities settlement (TARGET2-Securities, T2S), we plan to develop new services that can only be offered by Clearstream with its integrated international central securities depository. Our Regulatory Reporting Hub is designed to accommodate new regulations and to support market participants efficiently.

These initiatives also help Deutsche Börse Group achieve its overarching goal of better insulating its revenue against cyclical effects. Such factors will still dominate 2018 in certain areas, such as trading in the narrower sense of the word. Yet even in these areas, innovation within our existing portfolio is not only possible, but essential.

Deutsche Börse's goal is to be an efficient, innovative technology leader in all its core areas, in order to offer existing clients a consistently attractive, state-of-the-art range of service and to acquire new ones. ✕

Number of contracts traded on Eurex®

1,675.9m
-3%

Acquired capital via Deutsche Börse Venture Network®

€1.3 bn

System availability of trading system Xetra®/T7® 2017

99.97%
±0%

Numbers, please!

Xetra, Börse Frankfurt and Tradegate

Trading volume (single-counted)

€1,467.6bn
+7%

Return on shareholders' equity (annual average)

18%¹⁾

Net revenue

€2,462.3 m
+3%

Operating costs

€1,131.6m²⁾
-5%

Dividend per share

€2.45³⁾ +4%

Earnings before interest, tax, depreciation and amortisation (EBITDA)

€1,528.5m
+23%

117 sustainable index concepts

- 1) Adjusted for non-recurring effects
- 2) Including staff costs as well as other operating expenses, but excluding depreciation, amortisation and impairment losses
- 3) Proposal to the Annual General Meeting 2018

You will find a detailed overview of all key figures and their composition in the five-year overview in the [2017 financial report](#).

Our locations



EUROPE

AMSTERDAM
BERLIN
BERN
BRUSSELS
CORK
ESCHBORN
FRANKFURT/MAIN
LEIPZIG
LONDON
LUXEMBOURG
MADRID
MILAN
MOSCOW
OSLO
PARIS
PRAGUE
VIENNA
ZUG
ZURICH

NORTH AMERICA

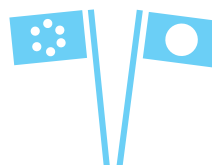
CHICAGO
NEW YORK

ASIA

BEIJING
DUBAI
HONG KONG
MUMBAI
SINGAPORE
TOKYO

AUSTRALIA
SYDNEY

Employees by region



Germany: 46%
Luxembourg: 19%
Czech Republic: 15%
Ireland: 6%
Others: 14%

Share price development

Closing price on 31 Dec 2016

Closing price on 31 Dec 2017

€77.54 → €96.80
+25%

Value of securities deposited with Clearstream

(annual average)

€13,465 bn
+3%

5,640 employees from

85 nations

work for Deutsche Börse Group.

€1,879.6 m
value added

Published by

Deutsche Börse AG
60485 Frankfurt/Main
Germany
www.deutsche-boerse.com

Concept and layout

Lesmo GmbH & Co. KG, Dusseldorf
Deutsche Börse AG, Frankfurt/Main

Photographs

Thorsten Jansen: portraits, Opportunities and expectations
Jörg Baumann: title, Our year 2017
Kirchgessner/laif: Regulatory updates

Printed by

Kunst- und Werbedruck, Bad Oeynhausen

Editorial deadline

23 February 2018

In combination with the financial report, this Annual constitutes Deutsche Börse Group's corporate report 2017. Both are available in German and English.

Order numbers

1000 - 4767 (German Annual)
1000 - 4768 (German financial report)
1010 - 4769 (English Annual)
1010 - 4770 (English financial report)

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