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# Financial technology (FinTech): Prospects and challenges for the EU


**SUMMARY**

FinTech, the abbreviation for financial technology, is a broad term. It is mainly used to refer to firms that use technology-based systems either to provide financial services and products directly, or to try to make the financial system more efficient. Examples include robotic trading, cashless payments, crowdfunding platforms, robo-advice, and virtual currencies. The value of global FinTech investment in 2015 grew by 75 % to US$22.3 billion. Corporates, venture capital and private equity firms have invested more than US$50 billion in almost 2 500 global FinTech start-ups since 2010.

The rapidly growing FinTech sector has its rewards and challenges (e.g. data and consumer protection issues, risk of exacerbating financial volatility and cybercrime) and is increasingly attracting political attention. The European Commission set up a Financial Technology Task Force (FTTF), and the European Parliament's Economic and Monetary Affairs Committee (ECON) presented its draft report on FinTech in January 2017. At G20 level, the Financial Stability Board (FSB) will present its study scrutinising FinTech in July 2017.

Due to the broad scope of FinTech, regulators can face a dilemma: rule-based regulatory frameworks set out compliance obligations clearly, but these are often expensive from a start-up perspective and could be an obstacle to innovation and job creation; principle-based regulation is more flexible, but could create some uncertainty as to what exactly is expected in terms of compliance.



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**Glossary**

**Blockchain:** a decentralised digital ledger of economic transactions that can be programmed to record financial transactions (and more) by allowing digital information to be distributed but not copied or changed. Data packages, 'blocks', are stored in a linear chain. This technology was originally devised for the digital currency Bitcoin, but today presents other potential uses.

**Crowdfunding:** the use of capital from several individuals (via social media and specialised websites) to finance a business project. It allows start-up companies to raise money without giving up control to venture capital investors. In return, it often offers investors the opportunity to acquire an equity position. Critics of crowdfunding argue that funds may, for instance, be used for different purposes than those initially disclosed, or that tax laws governing e-commerce are not clearly defined, e.g. in the case of cross-border funding.

**Distributed ledger:** a database that is consensually shared and synchronised across multiple sites, institutions or locations. It allows transactions to have public witnesses, making cyber-attacks more difficult. The participant at each node of the network can access the recordings shared. Changes or additions made to the ledger are copied to all participants.

**Peer-to-peer (P2P) lending:** a method of debt financing without the use of an official financial institution as an intermediary. It can also be described as 'social lending'.

**Robo-advice**: covers a broad spectrum of services, but essentially involves replacing face-to-face investment advice with online, automated guidance and execution. It does not involve actual robots, but rather relies on algorithms or online offerings to invest money. Potentially, robo-advice could deliver financial advice in a more cost-efficient way, making it affordable for a wider range of investors and reducing the financial advice gap.

**Robo-trading:** a form of automated stock trading. The best known kind of robo-trading is algorithmic trading, also referred to as algo-trading and black box trading, which is a trading system that utilises advanced and complex mathematical models and formulas to make high-speed decisions and transactions in the financial markets. Algorithmic trading involves the use of computer programs and algorithms to determine trading strategies for optimal returns.

**Virtual currencies:** digital representations of value, issued by private developers and denominated in their own unit of account. They can be obtained, stored, accessed, and transacted electronically, and can be used for a variety of purposes, as long as the transacting parties agree to use them. The concept of virtual currencies covers a wider array, including internet coupons, airline miles, and cryptocurrencies such as Bitcoin.

## Background

FinTech, the abbreviation for financial technology, is a broad term which is mainly used to refer to firms that are using technology-based systems in some way to either provide financial services directly or try to make the financial system more efficient. Originally, the term referred to technology applied to the back-end of established consumer and trade financial institutions. Today, the interpretation of FinTech has expanded to include any technological innovation in the financial sector, including innovations in financial literacy and education, retail banking, investment or office improvement (e.g. back-office functions). The expression FinTech has also become a synonym for the emerging financial services sector in the 21st century. In this context, FinTech covers a broad range of services and products, such as cashless payments, peer-to-peer (P2P) lending platforms, robotic trading, robo-advice, crowdfunding platforms, and virtual currencies, and is expected to expand further in the coming years.

The dynamic and rapidly growing FinTech sector is increasingly attracting interest at the political level. In Europe, on the one hand attention is paid to the potential contribution that FinTech might make to increase efficiency, strengthen financial integration and enhance the European Union's role as a global player in financial services; on the other hand, the need is pressing for clear, safe and effective regulation supporting innovation while also protecting consumers. Indeed, although more and more regulation in the field of financial services is defined at a European or international level, areas remain where Member States can choose to apply individualised or less strict rules at national level (e.g. crowdfunding and virtual currencies). This can result in either a fragmented environment preventing businesses from expanding across borders, or an uneven playing field and arbitrage opportunities, incentivising companies to obtain permits in less restrictive jurisdictions in order to minimise regulatory burdens while operating internationally. It should also be noted that, generally speaking, FinTech business models may not fit within the licensing regulations and ordinary supervisory procedures carried out by national regulatory agencies, as those rules are designed for the 'classical' type of financial institutions (e.g. banks).

Against this background, the European Commission set up a Financial Technology Task Force (FTTF) in November 2016, which looks at a number of issues affecting FinTech. The European Parliament's Economic and Monetary Affairs Committee (ECON) is preparing an own-initiative report on the influence of FinTech on the future of the financial sector. The rapporteur Cora van Nieuwenhuizen (ALDE, the Netherlands) presented her draft report on 27 January, and the committee is due to vote it in April.

## The evolution of FinTech

The interlinking of finance and technology is not a new phenomenon, beginning as far back as the 1860s, when the laying of the first transatlantic cable for telegraph communications launched the first age of financial globalisation by allowing the rapid transmission of financial information, transactions and payments around the world. Technological progress, such as the telex machine, the introduction of credit cards, handheld financial calculators and automatic teller machines (ATMs) in the 1950s and 60s, as well as the switch from analogue to digital industry in the 1970s, increased the speed of financial globalisation. The broad accessibility of the internet, the introduction of mobile phones, online banking and program trading in the 1980s, were further important financial innovations.[1]

In addition to these innovations, the global financial crisis of 2008-2009 set the framework for financial services and information technology as we know it today, and had a catalysing effect on FinTech. Indeed, the post-crisis financing gap, the growing public distrust of formal financial institutions and regulatory

**RegTech**

RegTech stands for 'regulatory technology'. It was created to address regulatory challenges in the financial services sector through innovative technology. RegTech consists of a group of companies that use technology to help businesses comply with regulations efficiently and inexpensively. The use of technology to comply with regulation is well-established, but the ever increasing focus on data and reporting makes it definitively unavoidable. Based on data-processing, RegTech allows companies to integrate the fulfilment of compliance requirements into business processes, improving companies' governance and management. Another advantage is that scalable solutions lower the barriers to entry and the costs for market participants. According to some commenters, however, RegTech has the potential to reduce compliance to prudential issues while increasing compliance with possible data regulation.

reforms such as the Dodd Frank Act or Basel III have not only increased financial institutions' compliance obligations (e.g. higher capital and reporting requirements) and introduced economic viability ('stress') tests, but also contributed to the rapid growth of the FinTech sector, by increasing the opportunities for FinTech firms to enter the financial sector providing innovative and cheaper services.

FinTech today comprises five major areas, for which Arner et al. suggest the following topology:[2]

(1) Finance and investment such as alternative financing mechanisms, particularly crowdfunding and P2P lending, but also robo-advisory services;

(2) Operations and risk management to build up better compliance systems (i.e. RegTech);

(3) Payments and infrastructure, such as internet and mobile payment systems, and infrastructure for securities trading and settlement and for over-the-counter (OTC) derivatives trading;

(4) Data security and monetisation to enhance the efficiency and availability of financial services (through the use of 'big data'), to better exploit the monetary value of data, and to tackle cybercrime and espionage;

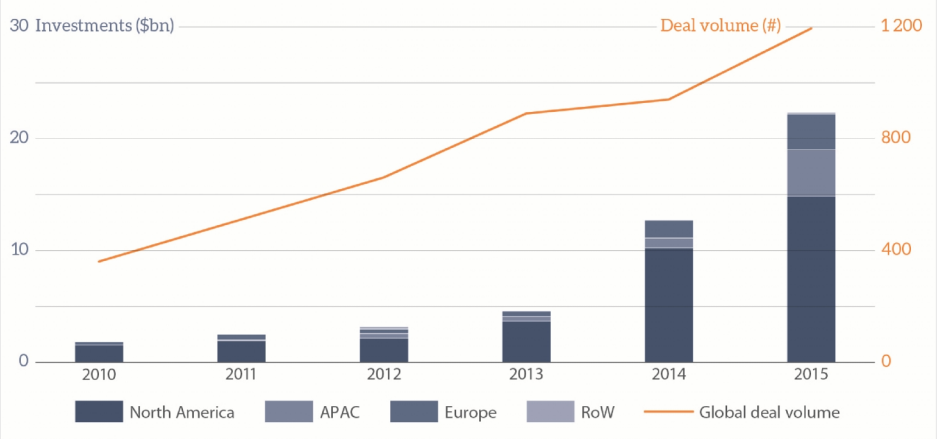
(5) Customer interface such as online and mobile financial services.

## Economic prospects and challenges

According to analysts, the value of global FinTech investment in 2015 grew by 75 % to US$22.3 billion. Corporates, venture capital and private equity firms have invested more than US$50 billion in almost 2 500 global FinTech start-ups since 2010. This trend was driven by relatively moderate growth in the United States' FinTech sector (the world's largest) which received US$4.5 billion in new funding (an increase of 44 %); rapid growth in China's FinTech sector, which increased 445 % to some US$2 billion, as well as in India (US$1.65 billion), Germany (US$770 million) and Ireland (US$631 million). In Europe, overall FinTech investment more than doubled, rising 120 % between 2014 and 2015, with the number of deals increasing by more than 50 %.[3]

In recent years, an increasing number of start-ups raised capital in lieu of equity directly on peer-to-peer (P2P) lending platforms. While P2P in the United Kingdom now represents about 14 % of new lending to small businesses, in the United States, due to the Jump Start Our Business (JOBs) Act of 2012, the number of P2P operators has risen from ten in 2010 to 111 in 2015, an annual increase of 61.8 %. Further potential growth channels include

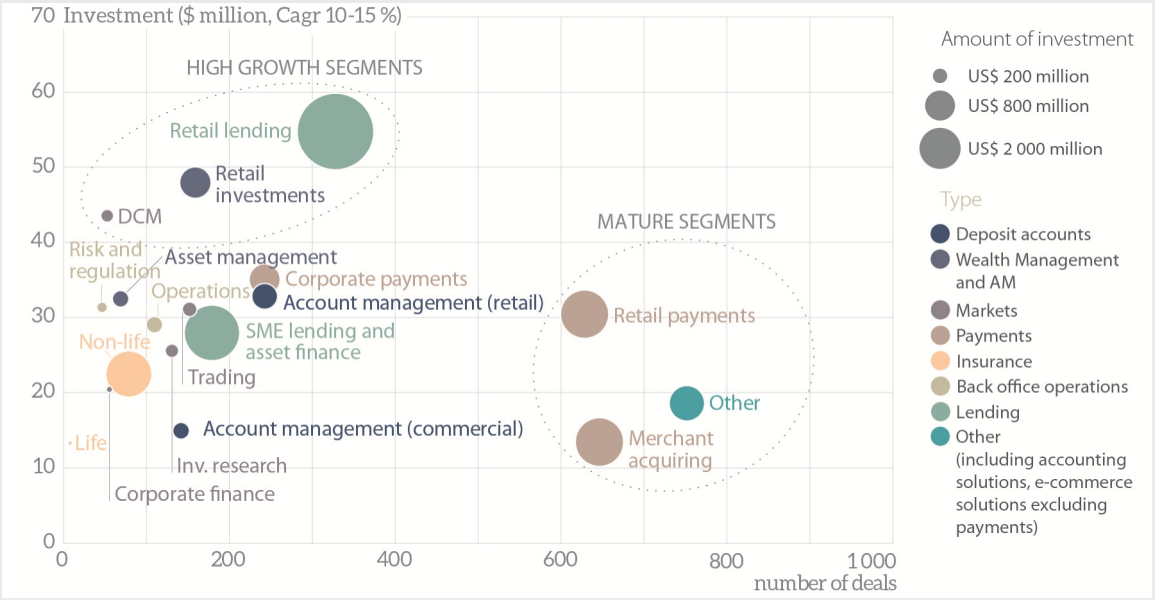
**Global FinTech financing activity (2010 – 2015)**




Source: Accenture, Fintech and the evolving landscape: landing points for the industry.

student loans and the securitisation of P2P loans. In 2020, industry revenue is forecast to grow 19.2 % annually to US$1.7 billion.

**Global FinTech financing activity by product segment, 2010-2015**




Source: Accenture, Fintech and the evolving landscape: landing points for the industry.

In Asia, which is expected to account for 60 % of the world's middle class by 2030, there is also a fast growing FinTech and P2P sector.[4] Since the late 1970s, China, for instance, has gone from a mono-banking model to over 80 banks and 2 000 P2P lending platforms. Inefficient financial and capital markets have created opportunities for informal alternatives; and the shortage of physical banking infrastructure and less stringent data protection and competition have further contributed to these developments. China, nevertheless, profits from its young digitally savvy populations equipped with mobile devices and its large numbers of engineering and technology graduates.[5] They will reinforce China's position as one of the leading FinTech nations, which is already impressive today: by the first quarter of 2012, there were 1 089 billion registered accounts in China's third-party internet payment and e-commerce market. Online payment provider Alipay, for instance, had over 800 million registered accounts at the end of 2012 and logs more than one million transactions per day.

As for Europe, new technologies can also make a substantial contribution to overcoming barriers that still hinder the full integration of market infrastructures, which is one of the factors on which the success of the capital markets union depends. Possible benefits of distributed ledger technology (DLT) applied to securities markets are listed in a European Securities and Markets Authority (ESMA) consultation paper. Distributed ledger technology could speed clearing and settlement by reducing the number of intermediaries involved in the process and by making the reconciliation more efficient. It could also facilitate the recording of ownership of a variety of securities and the safekeeping of assets, by promoting a unique reference database. Possible ambiguity of contract terms could also be reduced by means of DLT. Automated processing of corporate actions, which are one of the areas where further harmonisation is sought to fully benefit from the Target2-Securities (T2) platform, may increase. According to proponents, DLT could even be used to directly issue digital securities and track their ownership, potentially reducing fragmentation and transaction costs for capital

financing. While consulting stakeholders on potential benefits of DLT, however, ESMA underlines the key risks associated with this technology, and stresses that firms willing to use DLT should be aware of the existing regulatory framework (see below).

The European Central Bank (ECB) is also exploring possible DLT applications to post-trading activity. While recognising the improvements this technology could bring at different steps of the post-trading process, the ECB nevertheless concludes that, 'irrespective of the technology used and the market players involved, certain processes that feature in the post-trade market for securities will still need to be performed by institutions'.

Alongside their growing prospects, FinTech firms might constitute possible threats to traditional banks' profitability, as explored by Giorgio Gobbi, for instance. By leveraging the changes brought about by digitalisation, FinTech firms are providing services that have historically been the core business of commercial banks, and a large source of their earnings. Furthermore, by using remote distribution channels, they have contributed to lowering switching costs (the costs banks' customers incur when switching to competitors) that have granted the incumbent bank oligopoly power so far, as well as related profits. Gobbi argues that it is probably too early to establish whether these circumstances constitute real threats for traditional banks, but, as also Jean Dermine remarks, they are likely to have an impact on markets for services whose production implies highly intensive data processing, such as payments, standardised consumer credit, brokerage of securities, and passively managed funds. Banks are actively responding to these challenges, either trying to reproduce the FinTech firms' models (i.e. by setting up online lending platforms), or outsourcing part of their business processes to FinTech firms to take advantage of their greater efficiency.

> 'Banking is necessary, banks are not.'
>
> Bill Gates, principal founder of Microsoft, in early 1994.

## FinTech related regulation at the EU level

The Single European Act (1986) and the Maastricht Treaty (1992) set the framework for the establishment of a single market for financial services in the European Union and an ever increasing number of financial services directives and regulations.

Notwithstanding, no single overall legislation covers all aspects of FinTech. FinTech companies who provide financial services (e.g. lending, financial advice, insurance, payments), should comply with the same legislation as any other firm offering that service. Therefore, depending on the activity carried out (e.g. payment services, crowdfunding, etc.) different laws become applicable, such as Directive 2000/31/EC (e-commerce), Directive 2002/65/EC (distance marketing of consumer financial services), Directive 2009/110/EC (electronic money), Directive (EU) 2015/2366 (payment services), etc.

In the specific crowdfunding sector, the European Commission published a report in May 2016, which assesses national regimes. It tries to identify best practices, and presents the results of the Commission's monitoring of the evolution of the crowdfunding sector.

In the field of virtual currencies, the EU has not yet adopted any specific regulation. However, the European Commission suggests, in its July 2016 proposal for an anti-money laundering directive, regulation of virtual currency exchanges and custodians. In this context, it is worth mentioning that the European Parliament (EP) adopted a report

on virtual currencies, in May 2016, with a narrower scope, but which nevertheless covered one form of FinTech.

However, the Payment Services Directive (PSD) deserves a closer look. PSD I (Directive 2007/64/EC) was adopted in 2007, introduced more competition in the payment services market within the EU, and established the legal basis for the single European payments area (SEPA). While SEPA was successful in harmonising card and bank-to-bank payments, mobile and online payments remained fragmented.

In July 2013, the European Commission announced a new financial regulation package including the updated Payment Services Directive (Directive (EU) 2015/2366), the so-called PSD II, which repealed PSD I, and a proposal for regulation on interchange fees for card-based payment transactions (Regulation (EU) 2015/751). Michel Barnier, Internal Market and Services Commissioner at the time, justified the new rules by, inter alia, the fact that the fragmented rules in the payment industry in the EU create costs of more than 1 % of EU GDP or €130 billion a year. According to Barnier, the implementation of PSD II could boost the European economy, as the proposal seeks to 'promote the digital single market by making internet payments cheaper and safer, both for retailers and consumers. And the proposed changes to interchange fees will remove an important barrier between national payment markets and finally put an end to the unjustified high level of these fees.'

PSD II came into force on 12 January 2016. The deadline for implementation into national law is 13 January 2018. The new directive is designed to respond to technological changes in the payments industry. It aims to make payments and money transfers more secure and less expensive. At the same time, it also addresses differences in implementation of PSD I by Member States which are perceived as distorting competition. Under PSD II, the definition of payment services has been expanded, and the diversity of traditional payment service providers (PSPs), such as banks and financial institutions, has been increased. Account information service providers (AISPs), as well as payment initiation service providers (PISPs) (e.g. e-commerce payments) are all classified as third party service providers (TPPs) in PSD II.

Under the new directive, payment service providers are subject to the same rules as other payment institutions. In return, banks are obliged to provide API access (Application Programming Interface) to third parties. Non-banks will then have the right to access customers' data (provided that they have the customers' permission).

In this context, some experts argue that PSD II will level the field, and that FinTech start-ups might profit disproportionally over traditional payment stakeholders. They also think that this might be a 'key change' towards the creation of an open banking system. There is, however, criticism on PSD II. Serge Darolles of Banque de France notes that access to bank account information raises the question as to who should pay for the infrastructure needed for such interconnectivity. The most crucial issue raised is that of security, as the sharing and use of client identification details heightens the threat of cyber-attacks. If a payment services provider is hacked, it could unintentionally propagate the attack to all its clients' banks. Banks are thus calling for tighter security regulations for newcomers, and raising concerns about the authentication systems they use.

Since PSD II has some technical aspects, stakeholders are awaiting clarification from the European Banking Authority (EBA) on processes and data structures of the communication between the parties (according to Article 98 PSD II). The finalised

guidelines will be submitted to the European Commission by 13 July 2017. This information will provide answers to questions about access (APIs/TPPs), interoperability, fraud and security.

In December 2015, the European Commission published its green paper on retail financial services, which is seen as an effort on the part of the EU to take a more holistic view of the FinTech sector. Further comprehensive policy initiatives are expected in the near future.

## Data and consumer protection

Some experts say that the current EU legislation on data protection, competition and consumer protection is noticeably lacking in its definition of 'big data', creating a regulatory blind spot which needs addressing. Here, the European Supervisory Authorities (ESAs) on financial issues are currently evaluating the FinTech specific additions to the General Data Protection Regulation (GDPR) and/or other general consumer protection regulations. The Joint Committee of the ESAs has unveiled a public consultation paper, which touches, inter alia, on the potential benefits and risks of big data use. The purpose of the consultation is for the ESAs to understand what the big data phenomenon effectively means for consumers and financial institutions, among others. Stakeholders are invited to share their views by 17 March 2017. The European Commission is giving the ESAs time to obtain feedback from their public consultation before deciding on how to act.

On the issue of data protection (in the 'personal data protection' sense), the current legal framework is set by Directive 95/46/EC on the protection of individuals with regard to the processing of personal data and on the free movement of such data. This directive will be replaced by Regulation (EU) 2016/679 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data (General Data Protection Regulation). While the regulation entered into force on 24 May 2016, it shall apply from 25 May 2018. Its implementation is a key priority for the Commission. The website of the Commission Directorate-General for Justice and Consumers provides more information and a useful overview of the reform of EU data protection rules.

At the global level, the International Financial Consumer Protection Organisation (FinCoNet) has been working on the emerging consumer risks in the field of payments, and recently published a Report on online and mobile payments. The report focuses on how regulators and supervisors are addressing emerging risks, particularly security risks, and are keeping up with the pace of innovation. FinCoNet also provides a forum for supervisory authorities to engage with and learn from others on how best to meet these challenges. In this context, FinCoNet identified (i) the digitalisation of high cost lending and (ii) the practices and tools that are required to support risk-based supervision in a digital age, as two of its priority themes for 2017-2018.

In most countries, a consumer protection framework, which can be based on domestic (national legislation/codes), regional (European directives) or international standards (OECD/G20 principles), is already in place. Even where such frameworks are present, the OECD/G20 high level principles on financial consumer protection, developed by the G20/OECD Task Force on Financial Consumer Protection, set out clearly the key elements necessary for consumer protection. The G20/OECD Task Force has identified FinTech as one of the key areas for examination.

## FinTech laws and challenges for regulators

Generally speaking, there are two approaches to FinTech regulation: rule-based and principle-based. Rule-based frameworks create clear rules and processes. The compliance obligations are clearly set out, but this can limit the incentive for the supervised entity to do more, because the obligations are perceived as sufficiently comprehensive. From a start-up perspective, this approach is often expensive, as each rule and process needs to be identified and complied with. Principle-based models are flexible, but could create a level of uncertainty as to what exactly is expected in terms of compliance.[6]

Some experts argue that regulators should remain technologically neutral and focus on the outcome of a technology. They suggest a 'wait-and-see' approach, allowing regulators to learn whether the market will adopt the technology, and draw on historical data as to the risks a specific technology creates.[7]

Most FinTechs, however, prefer the more flexible compliance obligations of a principle-based regulatory regime. Under this regulatory approach, more focus is given to the spirit of a regulation, rather than 'box ticking'. The United Kingdom (UK) has taken this approach and is widely regarded as one of the most welcoming countries for FinTech. In spring 2016, the UK's Financial Conduct Authority (FCA) introduced, inter alia, a 'regulatory sandbox'.[8] In this context, the FCA expanded its responsibilities to advice and support, and introduced temporary permits (enabling start-ups to delay full compliance by two years). Furthermore, the FCA not only initiated a public consultation to understand and explain the regulatory hurdles faced by FinTech, but also put in place Project Innovate, which contains an Innovation Hub and Advice Unit for FinTechs and innovative businesses. Private parties subject to this regime may have a certain degree of discretion in implementing the regulation.

Rules-based regulatory regimes

| Potential positives | Potential negatives |
|---|---|
| Certainty and predictability, including with respect to future enforcement | 'Check-box' forms of compliance that strategically evade the underlying purpose of the regulation |
| Clear communication of steps for compliance | High internal costs of compliance |
| Ensures specific behaviour | Deterrence with respect to innovation |
| Uniform treatment of regulated entities | Frequent disconnect between the purpose of the regulation and the actual regulatory outcomes |
| | Obsolescence |

Principles-based regulatory regimes

| Potential positives | Potential negatives |
|---|---|
| Executive-level management involvement in incorporating regulatory principles into business models | Uncertainty and the risk of unpredictable post hoc application or arbitrage |
| Flexibility and innovation in the face of 'rapidly changing environments' | Concerns over fairness/bias in application |
| Speed in the regulatory process | Inadequate deterrence of specific problematic behaviour or activities |
| The centrality of guidance and evolving norms/best practices | Over-reliance on current norms and practices |

Source: Brummer, Chris and Gorfine, Daniel: FinTech: Building a 21st-Century Regulator's Toolkit, Milken Institute – Center for Financial Markets, October 2014.

In contrast, there is the German approach. According to Andreas Dombret, Germany's financial regulatory logic is equally applicable to any innovative, IT-based business. The main reason is that regulation is rigorously built on risk orientation and that the principle of 'same business, same risk, same rules' applies. Technical implementation

issues are not taken into consideration when defining permissions and responsibilities ('technical neutrality'): 'Banking without banks – in the sense of a financial intermediary providing all the services of a bank without being treated as a bank by supervisory authorities – is therefore irreconcilable with existing financial regulation.'

In this context, Arner et al. suggest to considering rule-based or principle-based frameworks as not mutually exclusive. They argue that a rule-based framework can make start-ups more attractive to investors (due to better legal predictability and higher compliance costs). Start-ups could increase their access to sufficient financial resources: 'The higher costs and complexity associated with a rule-based approached can thus be understood as a benefit, both for the company and the investor.'[9]

## FinTech: What's next?

Due to its technological innovation, FinTech might bring banking services to more people. But it could also 'exacerbate financial volatility' and increase risks emanating from robo-advice. In addition, the increasing complex interconnectivity of (global) financial services makes it more vulnerable to cyber-attack. Both the Bank of England and the Deutsche Bundesbank expect more intrusive regulation for banks and FinTech companies that use disruptive technology in financial services, as the use of the technology itself becomes more sophisticated and widespread. According to the Governor of the Banque de France, specific regulations that allow for 'a gradual adjustment of regulatory intensity' may be better suited to addressing risks in the financial technology industry.

At the international level, in April 2016 the G20 Financial Stability Board (FSB) started examining the potential risks that FinTech could pose to global financial stability. The FSB is currently carrying out a mapping exercise focusing on the impact of digitalisation and FinTechs in the banking sector and the possible implications for banking supervision. The FSB's scrutinising study on FinTech will probably be published in July 2017. A number of international organisations have launched similar reflections in their areas of competence, for instance, in the insurance sector. It is possible that this could result in a global regulatory framework for FinTech.

At the same time, there are attempts at the EU level to collect FinTech related information and data and to explore how FinTech companies can address cross border take-up of financial services and financial inclusion. In the first status report on the capital markets union (CMU), the Commission envisages, in its CMU action plan, a comprehensive assessment of European markets for retail investment products, including distribution channels and investment advice, by 2018. The assessment will draw on the input of experts and consider 'whether retail investors can access suitable products on cost-effective and fair terms, and whether the potential offered by new possibilities stemming from online-based services and other technology to make financial services more efficient (FinTech) is being harnessed.'

The European Commission expressed its objective as understanding the FinTech sector and its players better, as well as evaluating its impact on the banking sector and financial services industry and its incumbent players. In July 2016, the European Commission Directorate General for Communications Networks, Content & Technology (DG CONNECT), published a call for tenders (Overview of the European FinTech sector — SMART 2016/0042) to conduct a study on the FinTech sector. This study should:

- describe the key European players and their position in the global context, their innovative technology and business models, and their potential impact on current regulation;
- propose various scenarios for the future of the financial services industry and the role of FinTech companies and of EU policymaking and regulation in that context; and
- identify specific issues to be solved in relation to digital single market, the capital markets union, retail banking and other related EU policy initiatives.

In addition, the European Commission's Directorate-General for Financial Stability, Financial Services and Capital Markets Union is organising a FinTech related conference on 23 March 2017. The conference, #FinTechEU: Is EU regulation fit for new financial technologies?, will discuss, inter alia, how technology is transforming finance, regulatory and supervisory innovation and security issues.

## Main references and further reading

Accenture: Fintech and the evolving landscape: landing points for the industry, 2016.

Arner, Douglas W., Barberis, Janos, Buckley, Ross P.: The Evolution of FinTech: A New Post-Crisis Paradigm?, University of Hong Kong Faculty of Law Research Paper No 2015/047, October 2015.

Banque de France (ed.): Financial Stability in the Digital Era, Financial Stability Review (FSR), April 2016.

Brummer, Chris and Gorfine, Daniel: FinTech: Building a 21st-Century Regulator's Toolkit, Milken Institute – Center for Financial Markets, October 2014.

Chishti, Susanne and Barberis, Janos (eds.): The FINTECH Book: The Financial Technology Handbook for Investors, Entrepreneurs and Visionaries, Wiley, 2016.

CrowdfundingHub: Current State of Crowdfunding in Europe – An overview of the Crowdfunding Industry in more than 25 Countries: Trends, Volumes & Regulations, Amsterdam, 2016.

EPRS, Bitcoin – Market, economics and regulation, Briefing, 11 April 2014.

EPRS, Crowdfunding – an alternative financing option for SMEs, At a glance, November 2014.

EPRS, Virtual currencies: Challenges following their introduction, Briefing, March 2016.

EPRS, Distributed ledger technology and financial markets, Briefing, November 2016.

EPRS, How blockchain technology could change our lives, In-Depth Analysis, February 2017.

Ernest & Young: UK FinTech – On the cutting edge: An evaluation of the international FinTech sector, 2016.

ESMA: Press release, Investment-based crowdfunding needs EU-wide common approach, European Securities and Markets Authority, ESMA/2014/1568, 18/12/2014.

ESMA: Automated Trading Guidelines: ESMA peer review among National Competent Authorities, ESMA/2015/592, 18 March 2015.

European Central Bank: Virtual currency schemes – a further analysis, February 2015.

European Commission: Capital Markets Union: First Status Report, SWD(2016) 147 final, Brussels, 25 April 2016.

European Commission: Crowdfunding in the EU Capital Markets Union, SWD(2016) 154 final, Brussels, 3 May 2016.

Gobbi, Giorgio: The troubled life of the banking industry, Wolpertinger Conference 2016, University of Verona, 2 September 2016.

Pinsent Masons 'financial services' blog: Redesigning the EU regulatory framework for fintech and digital financial services, 18 February 2016.

Roland Berger: Barriers to FinTech innovation in the Netherlands, 21 January 2016.

William Fry: The Fintech and Payments Revolution of PSD2: What Do I Need To Know?, Financial Regulation Group Finance, April 2016.

## Endnotes

[1] See Arner et al., Chapter 2.

[2] Arner et al., pp. 18-20.

[3] Interestingly, traditional financial services have been a driving force in the IT industry (for at least 20 years), to the extent that some of them can also be considered tech companies. For instance, in 2014 approximately one third of Goldman Sachs' 33 000 full-time staff are engineers and programmers – more than Twitter or Facebook.

[4] Arner et al., p. 22.

[5] The benefits of internet finance companies require consideration. The Chinese tech giant Alibaba has created some 2.87 million direct and indirect jobs in China, and provided over 400 000 SMEs with loans ranging from US$3 000 to US$5 000. Arner et al., p. 22ff.

[6] Brummer/Gorfine, p. 7ff.

[7] Arner et al., p. 33.

[8] Regulatory sandboxes can be considered 'safe spaces' in which businesses test – for a limited time and without being exposed to the normal regulatory burden – their models, products and services.

[9] Arner et al., pp. 36-37.

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