Fine-Tuning Europe

How to Win the Global FinTech Race?

Tsvetelina Kuzmanova
Credits

The Wilfried Martens Centre for European Studies is the political foundation and think tank of the European People’s Party (EPP), dedicated to the promotion of Christian Democrat, conservative and like-minded political values.

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Editor: Dimitar Lilkov, Research Officer at the Wilfried Martens Centre for European Studies
External editing: Communicative English bvba
Layout and cover design: Gëzim Lezha, Visual Communications Assistant, Martens Centre
Typesetting: Victoria Agency
Printed in Belgium by Puntgaaf, Kortrijk.

This publication receives funding from the European Parliament.

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**Keywords**  FinTech – Financial technology – Big data – Artificial intelligence –
BigTech – EU policy – Financial regulation
About the Martens Centre
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Executive summary
The term ‘financial technology’ (FinTech) refers to technology-enabled innovation in the financial sector. FinTech could result in new business models, products and services. It has been rapidly developing around the world, offering innovative products and services that are quickly gaining traction with consumers and investors. This has resulted in a new, constantly evolving financial landscape of new market dynamics, new market players and business models, and new risks and opportunities. Different countries and regions around the world are finding themselves caught up in this fast-paced ecosystem, where their competitiveness depends on a variety of factors, including the interaction of different market players, access to funding and talent, and regulatory measures.

This paper examines the latest developments in specific financial technologies, major financial services and product providers. It also looks at the conditions which are shaping financial centres’ competitive significance in FinTech on a global scale. Recent trends suggest that the US and China are emerging as key hubs for unlocking the disruptive potential of financial innovation in terms of the scale of their FinTech businesses and investments compared to Europe. Along with traditional financial institutions and small technology companies, American and Chinese BigTech giants—large globally active technology firms—appear to be the main players shaping the innovation landscape in the financial industry. For the comparatively smaller and younger European FinTech companies it would be challenging to compete with them without favourable government initiatives and support.

The EU has already undertaken certain measures and initiatives in order to nurture its FinTech firms, but at the moment it lacks a targeted, EU-wide approach to FinTech. The policy landscape remains rather fragmented with different national approaches to legislation and regulation. The paper examines the current EU policies, initiatives and frameworks for the purpose of providing forward-looking policy recommendations for a more competitive and innovative single European market in the financial sector.
Introduction
In the past 10 years new technologies and innovation have significantly altered most industries. These changes have introduced different levels of disruption and changed the competition landscape. In the financial sector the buzzword has been ‘FinTech’ (‘financial technology’). It refers to innovations that threaten to ‘bring down the legacy of the traditional financial world’.

The interaction between finance and technology is not a new phenomenon. There are numerous examples of how technology has been used to deliver financial solutions, such as the introduction of the first automatic teller machines (ATMs) in the 1960s. However, recent years have seen a rise in the use of FinTech, a wide array of innovative products and a high pace of development. The global financial crisis in 2008 was the pivotal moment for the development of new types of FinTech. Since then, new start-ups and established big technology companies have entered the arena of providing financial products and services, essentially changing the paradigm in favour of more bottom-up, client-focused business models. To some extent this surge in the use and development of FinTech has been fuelled by the post-crisis loss of faith in the traditional banks. User experience is another key driver, as the simpler, cheaper and more convenient solutions are designed to be available through all types of digital devices. More personalised and convenient services are particularly appealing to millennials, 73% of whom would welcome financial services from ‘a trendy, non-financial service provider’.

In 2014 these new trends started to attract the attention of all industry participants, consumers, investors, regulators and academics, and the term ‘FinTech’ has now gained popularity and worldwide acceptance in the broader business world. At the market level, innovations have achieved initial mass
adoption in 27 countries, in which the percentage of the population, on average, that can be considered digitally active consumers of FinTech currently stands at 64%, and is growing.\textsuperscript{11} In 2018 alone, global investments in FinTech companies doubled, reaching $111.8 billion.\textsuperscript{12} It is evident that FinTech is here to stay and is significantly changing the world of finance. What will this mean for the European capital markets, consumers, regulators and policymakers? The following sections discuss the global FinTech landscape, focusing on the innovations with the greatest potential to be disruptive, together with the benefits they offer and the risks they pose, and how they fit into the EU policy and regulatory framework.

Key FinTech products and services
FinTech encompasses a wide range of technology-based systems which businesses use to provide services and products directly, or to make existing financial systems more efficient. FinTech solutions incorporate a variety of technologies, including cloud computing, cashless payments, big data analytics, artificial intelligence (AI), crowdfunding, peer-to-peer lending platforms, mobile applications, robo-advice, blockchain and distributed ledger technology (DLT), and virtual currencies. The following sections analyse some of these new technologies, focusing on those which have the highest disruptive potential.\(^{13}\)

## Payments

New payment products and services have been the first area of disruption and the main drivers for the adoption of FinTech, as 96% of digitally active consumers have used them.\(^{14}\) The highest number of FinTech providers are thus also involved in the field of payments.\(^{15}\) While there are new start-ups in various FinTech subsectors, this area has generally been the most mature and consolidated, and has attracted the most investment.\(^{16}\) Online shopping is growing quickly. Online sellers are now accepting payments via web applications, which is leading to more online payments and cashless solutions, and doing away with the need for traditional bank accounts.\(^{17}\) Large technology companies have entered this space, providing payment services through their platforms. Thus, we have seen the launch of, among others, Google Pay, Amazon Pay, Messenger Pay for Facebook and Apple Pay. China is the largest market, with mobile payments reaching 16% of GDP (around €2 trillion). Here two companies—Alibaba’s payment platform Alipay, and Tencent’s WeChat Pay—have built separate payment infrastructure integrated with their core products. Together they account for 94% of the mobile payments market in the country, leading the Chinese transition to a cashless society.\(^{18}\)

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\(^{13}\) AFME and PwC, *Technology and Innovation in Europe's Capital Markets*, 10.


One notable trend in the adoption of technology for payments is the growing use of data collected on customers and their transactions. By enabling the creation of value-added financial products and services better tailored to customers’ needs, data itself becomes a key commodity. The ownership and control of data are thus becoming more important for stakeholders, and companies are increasingly looking into ways of exploiting the monetary value of data.\textsuperscript{19} Even traditional financial institutions are partnering with non-financial firms, such as tech companies and data firms, to unlock the value of transaction data.\textsuperscript{20}


\textsuperscript{20} Deloitte, \textit{Beyond Fintech}, 9.
Figure 1 Consumer FinTech adoption across 27 countries

Big data

As a consequence, data is playing an increasingly important role in financial services and is seen as a main enabler for future technological change. Big data analytics is considered one of the innovations with the greatest potential to transform the financial sector. Big data can be described as ‘the large volume of data that can be generated, analysed and increasingly used by digital tools and information systems.’ It is characterised not only by the growing availability of data, but also by the capabilities to process and store it. Core data assets, such as client, product, account and transaction data, are used to generate insights, which in turn can enhance the efficiency and availability of services, or even be used in fraud detection. Moreover, financial institutions and FinTech companies are increasingly using new data sources. They combine ‘rich, differentiated data from multiple sources and use it in real time’. For instance, the insurance sector is increasingly making use of datasets such as genetics data, or behavioural and socio-demographic data that reflect the lifestyle of consumers: data on shopping habits, bank accounts and credit card use. Telematics data is also gaining popularity. This is the collection of all kinds of information from remote, moving objects using telecommunication networks. These remote objects include black boxes in cars and wearable devices.

With this technology big non-financial market players with established networks and accumulated big data have entered the financial services space, mainly in payments, but also in insurance, wealth management and credit. A platform, such as Facebook, Amazon or Alibaba, provides multiple clients

22 AFME and PwC, Technology and Innovation in Europe’s Capital Markets, 8–9.
24 Ibid.
26 Deloitte, Beyond Fintech, 9.
28 BaFin, Big Data Meets Artificial Intelligence: Challenges and Implications for the Supervision and Regulation of Financial Services, Report (July 2018), 121.
with an access point to a variety of other businesses.\textsuperscript{30} The information obtained could be used to offer better-quality, lower-cost, or even free, services and products that are more closely tailored to consumers’ needs.\textsuperscript{31} At the same time, this raises security, privacy and ethical concerns. Other possible consumer protection issues include the impact on pricing, or on access to products and services, when these are determined by ‘analytical data showing a customer’s likely willingness to pay more, or demonstrating his/her inertia to switch products’.\textsuperscript{32}

**Artificial intelligence**

Another key innovation used in the financial sector is AI.\textsuperscript{33} It is often considered together with big data as an additional layer for data analytics and a major tool for discovering patterns, classification and prediction. AI is also seen as one of the technologies with the greatest potential to transform the sector. It is anticipated that the future will see a rise in the use of AI.\textsuperscript{34} ‘AI is an umbrella term for a number of algorithms and technologies that allow machines to simulate human intelligence by learning, reasoning and self-correction.’\textsuperscript{35} The use of AI technology, and that of machine learning (ML) as an application of AI, are already altering the provision of some financial services. They are being actively employed in some segments of the financial system: fraud detection, capital optimisation and portfolio management.\textsuperscript{36} The benefits that have been identified include multichannel customer access, increased self-service by customers, greater insight into customers’ needs and more customised services.\textsuperscript{37} The use of AI can also be


\textsuperscript{31} Financial Stability Board, *FinTech and Market Structure in Financial Services*, 3.


\textsuperscript{33} Joint Committee of the European Supervisory Authorities, *Joint Committee Final Report on Big Data*, 22.

\textsuperscript{34} AFME and PwC, *Technology and Innovation in Europe’s Capital Markets*, 8–9.

\textsuperscript{35} Ibid., 15.


beneficial for financial stability by boosting the efficiency and resilience of financial services and regulatory and systemic risk surveillance.\textsuperscript{38} On the other hand, a potential competition issue is the emergence of new systemically important players and third-party dependencies, as AI and ML are increasingly being offered by a few large technology companies, which are often outside of the regulated space.\textsuperscript{39} Another problematic aspect of the technology is that the algorithms are becoming more complex, making it difficult to explain or predict the outcomes of the decisions made.\textsuperscript{40} A recent trend in credit companies, for example, is that they start using FinTech companies, which feed non-traditional data into their algorithms to generate credit scores. However, in determining the credit score, these systems are likely to detect signals of questionable relevance and to take seemingly unrelated factors into consideration.\textsuperscript{41} A 2018 study examined the information fed into such algorithms from consumers’ ‘digital footprint’ to generate credit scores. This ‘footprint’ consists of the information people leave behind when uploading financial information, using social networks or even registering on a website.\textsuperscript{42} The study found out that Android users default more frequently on their loans than do iPhone users and that this affected the score outcomes.\textsuperscript{43} This is an example of how the complexity of algorithms can produce a biased result, which in turn affects consumers.

**Distributed ledger technology**

Another prominent innovation with the potential to be applied extensively across the financial sector is distributed ledger technology (DLT). The term refers to a novel and fast-evolving approach to recording and sharing information in a distributed network of multiple computer servers, where each has exactly the same data.\textsuperscript{44} An important feature of the technology is the use of cryptography—computer-based encryption tech-

\textsuperscript{38} Financial Stability Board, *Artificial Intelligence and Machine Learning in Financial Services*, 33.
\textsuperscript{40} Financial Stability Board, *Artificial Intelligence and Machine Learning in Financial Services*, 33–4.
\textsuperscript{43} Ibid., 18.
\textsuperscript{44} World Bank Group, *Distributed Ledger Technology (DLT) and Blockchain*, FinTech Note no. 1 (2017), Overview VII.
techniques—for data storage and validation.\textsuperscript{45} Blockchain is a particular type of DLT, which uses cryptographic and algorithmic methods to create and verify data.\textsuperscript{46} Although there is a general recognition of the many potential uses of the technology, the most well-known application of DLT today is crypto-assets: a type of private asset dependent on cryptography and DLT. These can range from cryptocurrencies, such as Bitcoin, to digital tokens issued through Initial Coin Offerings (ICOs), where some are meant to be a means of exchange, while others attribute profit and governance rights.\textsuperscript{47} The potential benefits and future applications are vast, and the technology is largely seen as a tool to enhance financial products, services and operations.\textsuperscript{48} Not being subject to any sort of regulation, however, it raises serious regulatory concerns about consumer protection. For example, it has been estimated that 78\% of ICOs launched since 2017 can be considered scams (Figure 2).\textsuperscript{49}

\begin{figure}[h]
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\includegraphics[width=\textwidth]{figure2.png}
\caption{Listed coins/tokens, $50m+ market cap}
\end{figure}


\textsuperscript{45} ESMA, \textit{The Distributed Ledger Technology Applied to Securities Markets}, Report (February 2017), 4.
\textsuperscript{46} M. Thake, ‘What’s the Difference Between Blockchain and DLT?’, \textit{Medium}, February 2018.
Cryptocurrencies pose various potential risks, such as price volatility, as well as money laundering and financing of terrorism due to transaction anonymity.\textsuperscript{50} Despite all these concerns, however, the disruptive implications of DLT for recording and validating data in the financial ecosystem—thus affecting businesses, consumers and regulators alike—are numerous. There are already signs that there will be a certain level of institutionalisation in that direction in the near future.\textsuperscript{51}

**Libra case study**

The Libra project, which was formally announced by Facebook on 18 June 2019, provides a good example of some of the technologies outlined above. Built on blockchain technology, Libra is a new digital currency. Its mission is to become accepted across the world and to create a financial infrastructure that empowers billions of people.\textsuperscript{52} At the time of writing (September 2019), Libra remains little more than an idea. The Libra white paper states that the project will be made up of the following elements:\textsuperscript{53}

- The *Libra currency* will operate on permission-based, open-source blockchain. This means that access will be granted to run a validator node, but the blockchain itself is designed so that anyone can build on it. The Libra white paper also states that the blockchain is built to be ‘secure, scalable and reliable’ to make the currency a cost-effective and more efficient way for payments and remittances for people with limited access to banking services.\textsuperscript{54}

- The *Libra Reserve* is designed to ensure that Libra is stable and to address the issue of volatility that other cryptocurrencies have with price fluctuation. Libra will be fully backed by ‘a collection of low-volatility assets, such as bank deposits and short-term government securities in currencies from stable and reputable central banks’, held in the Libra Reserve. Coins will be minted and burnt according to market demand and the Reserve will act as buyer of last resort.\textsuperscript{55}

\textsuperscript{53} Ibid., 1–9.
\textsuperscript{54} Ibid., 3.
\textsuperscript{55} Ibid., 7.
• The Libra Association will govern the Libra Blockchain and the Libra Reserve. Headquartered in Geneva, Switzerland, it is a not-for-profit organisation. There are currently 28 ‘founding members’: businesses, non-profit and multilateral organisations, and academic institutions. Each founding member runs one validator node. The number of members is expected to grow to around 100 by the launch in the first half of 2020.

• Calibra is the Facebook-run, regulated subsidiary which will develop financial services for Libra and at the same time ensure that financial and social data remain separate. Calibra will provide a digital wallet, integrated into Facebook platforms such as WhatsApp and Messenger, that will allow people to spend, send and save Libra.56 Calibra intends to register with the US Treasury Department as a money service business.57

Governments and authorities around the world have been quick to express their concerns over the project. With Facebook’s user base of over two billion worldwide, Libra would immediately achieve a systemic scale, which could lead to a monopoly of the market, with no guarantees against financial risks or vulnerabilities.58 At the G7 Summit in July 2019, finance ministers and central bankers opposed the idea that companies could create means of payment comparable to those of countries, without being under state control and subject to state standards.59 In a joint statement on Libra, France and Germany declared that they would block the project because it failed to convince that the risks the currency might pose to financial security, investor protection, the prevention of money laundering and terrorism financing, data protection, and financial and monetary sovereignty were properly addressed.60

57 D. Marcus, ‘Hearing Before the United States Senate Committee on Banking, Housing, and Urban Affairs’, Testimony given on 16 July 2019, 4.
Global landscape
With the advent of these technologies and the fast pace at which they are being developed, countries around the world are focusing more and more on ways to facilitate the adoption of the new technology in order to boost their economies. There is also a growing awareness of the need for new government measures and frameworks to enable the creation of a digital infrastructure and an environment conducive to innovation.\textsuperscript{61} In this way a new global FinTech landscape is emerging. Countries are trying to capitalise on it and to maintain their competitive edge within it.

FinTech hubs

The most vibrant and successful FinTech developments are concentrated in geographically specific ecosystems. These are FinTech hubs, where innovators, investors and regulators can interact and build networks to cooperate with and learn from one another.\textsuperscript{62} The hubs are often named after the city in which they are located. The Global FinTech Hub Index 2018\textsuperscript{63} examines the 70 most prominent cities in 6 countries against a combination of key determinant factors. It ranks the top 30 hubs, and also lists emerging ones (Table 1). Of those most highly ranked, seven FinTech hubs are classified as ‘global’ for their systemic and global significance: four in China, two in the US and one in the UK. The rest have a more regional significance. In order of their ranking, these seven hubs are Beijing, San Francisco, New York, London, Shanghai, Hangzhou and Shenzhen.\textsuperscript{64} It is interesting to note that in almost all of the parameters examined, Beijing comes first in the ranking, often followed by other Chinese cities. This holds for the parameters FinTech industry, leading companies, fundraising and FinTech adoption rate by consumers.\textsuperscript{65} It is evident that Asia (including hubs in countries other than China, such as Singapore, Hong Kong, Tokyo, Seoul and Mumbai) and the US are leading, while the developments in Europe are slower (Figure 3). The European


\textsuperscript{63} See Ben et al., \textit{The Future of Finance is Emerging}, 1–2.

\textsuperscript{64} Ibid., 6–7.

\textsuperscript{65} Ibid., 9–13.
Economic Area cities included in the ranking are Paris (15th), Stockholm (17th), Berlin (22nd), Dublin (28th), Zurich (29th) and Amsterdam (30th). Additionally, 6 of the 25 emerging FinTech hubs are in the EU and are expected to gain traction in the future: Barcelona, Frankfurt, Warsaw, Milan, Brussels and Vilnius. All these hubs share several key characteristics conducive to the growth of FinTech: markets for the new technologies, available capital and talent, and progressive government policies and regulation.

**Figure 3 FinTech global landscape: Asia and Americas lead, Europe follows**

*Source: Ben et al., The Future of Finance is Emerging, 6.*

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66 Ibid., 2–7.
67 Ibid., 8.
### Table 1 Top 30 FinTech hubs

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<tr>
<th>City</th>
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<th>FinTech Industry Ranking</th>
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Markets

There are a multitude of factors that shape the market for financial innovation in different regions, but they can be profitably looked at from a supply-and-demand perspective.

Starting with the demand side, awareness of FinTech solutions is growing, driven in part by digitally active customers in emerging markets such as China, India, Russia and South Africa. In these countries the adoption rate is above 80%, well above the global average of 64%. In China and India, where adoption rates stand at 87%, the majority of the population are regular users of FinTech services (Figure 1).69 To some extent this trend has emerged due to the large tech-literate, but financially underserved population in these two countries.70 The countries of the Asia–Pacific have both the highest growth of the middle class and the greatest rise in income. For this reason, these countries will also see the largest demand for technology-driven innovation. It has been projected that by 2030, 66% of the global middle class will be in the Asia–Pacific, against 14% in Europe and 7% in North America.71 Additionally, financial innovation, enabled by information and communication technology, increasingly appears to have the ability to provide services to, and thus empower, groups within society that have previously lacked access to financial services.72 The most underbanked regions are the Middle East, Sub-Saharan Africa, Latin America and Asia.73 Thus, FinTech could have a relatively higher impact and adoption rate there.

On the supply side, we have different types of service providers with varying regional or global significance. In the financial sector the key players in innovation are the incumbent financial institutions, FinTech start-up companies and large technology companies, that is, BigTech.74

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70 Ibid., 12.
72 Varga, Fintech, 231.
73 Ibid., 241.
74 Financial Stability Board, Fintech and Market Structure in Financial Services, 1.
Incumbents still play a major role when it comes to FinTech, as they recognise the need to innovate. The rise of new FinTech entrants, combined with the post-crisis regulatory reforms, has prompted traditional financial institutions to focus on technology in order to compete with the newly emerging players.\textsuperscript{75} Investments in financial innovation in the US during 2018, for instance, were characterised by broader participation by mid-sized banks and financial institutions.\textsuperscript{76} Moreover, in introducing their own FinTech offering, these institutions do not necessarily compete with FinTech companies. Rather, they often partner with or outsource to these companies, creating relationships that are more complementary in nature.\textsuperscript{77}

On the other side of the spectrum, FinTech firms are already establishing themselves not only as significant players in the industry, but also as mainstream financial services providers. In terms of bigger players among the FinTech start-ups, globally there are 41 FinTech companies with private market valuation over $1 billion, the ‘unicorns’. Of these, 25 are in the US, 8 in Asia (4 in China, 1 in Japan, 1 in South Korea and 2 in India), 6 in Europe, 1 in Australia and 1 in Brazil. The European unicorns include OakNorth, TransferWise, Revolut and Monzo in the UK, the German challenger bank N26 and the Swedish Klarna.\textsuperscript{78} Recent trends suggest that we can anticipate similar developments and the growth of such companies in the future as well, because 19 of them have passed the unicorn threshold only since the beginning of 2018.\textsuperscript{79} FinTechs are and will continue shaping the future of the financial services industry—often, and increasingly, in collaboration with incumbent institutions and BigTech companies, to take advantage of their large customer base.\textsuperscript{80}

‘BigTech refers to large globally active technology firms with a relative advantage in digital technology.’\textsuperscript{81} They usually provide web services through the Internet to end-users, operate globally, have a vast customer base and can rapidly gain a significant market share by launching financial services and products. Examples of such companies in the Western world are Google, Amazon, Facebook and Apple, collectively known as ‘GAFA’. China’s three technology giants are referred to as ‘BAT’: Baidu, Alibaba

\textsuperscript{75} Zetzsche et al., \textit{From FinTech to TechFin}, 7.
\textsuperscript{76} KPMG, \textit{The Pulse of FinTech 2018}, 35.
\textsuperscript{77} Financial Stability Board, \textit{FinTech and Market Structure in Financial Services}, 11.
\textsuperscript{80} KPMG, \textit{The Pulse of FinTech 2018}, 35.
and Tencent. Microsoft and IBM are often considered BigTech companies as well. Microsoft and IBM are often considered BigTech companies as well.82 Such ‘platform’-like companies, despite their global outreach and presence, originate mainly in the US and China. There is no equivalent in Europe,83 at least not on the same scale.

BigTechs’ activities are rapidly expanding, both geographically and in terms of their range of financial services: credit, insurance, wealth management services and investment products.84 Amazon, for instance, lent over $1 billion to small and medium-sized businesses in the US in 2017,85 and it is now partnering with the Bank of America and expanding lending to the UK, Japan and India. Amazon is reportedly in talks with banks, including JPMorgan and Capital One, to develop a product similar to a checking account.86 In the UK the company is offering an insurance product for online purchases called ‘Amazon Protect’.87 Additionally, Amazon Web Services is the largest provider of cloud services in the world, its customers including many financial institutions.88 Amazon is also aggressively entering emerging markets, most notably India and Mexico, to expand and pilot new products and services there.89

In China these trends are even more pronounced. A good example is Ant Financial, the Alibaba financial services subsidiary. Although created only in 2014, it is now worth $150 billion and thus ranks among the world’s most valuable financial services firms.90 Based on data from its e-commerce business and its mobile payments platform (Alipay), Ant has extended its product range into lending, wealth management, insurance and credit scores. Yu’e Bao, a money market fund that invests spare change from Alipay wallets, is now the largest money market fund in the world, managing $211 billion.91 Ant is also a major distributor of insurance products, with over 80 insurance companies selling thousands of

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82 Ibid.
84 Financial Stability Board, FinTech and Market Structure in Financial Services, 12.
86 CB Insights, Everything You Need to Know About What Amazon Is Doing in Financial Services, Research Report (June 2018), 8.
87 Ibid., 12.
89 CB Insights, Everything You Need to Know About What Amazon Is Doing in Financial Services, 14.
91 Ibid., 25.
products through its marketplace and a majority stake in two other insurance companies.\textsuperscript{92} The company has also entered the residential rental market, enabling flat rental through its Alipay application.\textsuperscript{93}

At the same time, Chinese BigTech companies are making a strong global push towards foreign markets. Alibaba and Tencent have done this through their mobile payment services, which allow Chinese tourists abroad to use their platforms. Chinese travellers can now use Alipay in over 110 markets, including the US, the Middle East, Africa and 26 European countries.\textsuperscript{94} Chinese BigTechs are also purchasing stakes in local companies, mainly in Asia, and ‘stitching them together into complex ecosystems of services to control financial and data intermediation’ there.\textsuperscript{95} Alibaba and Tencent alone have stakes in over a thousand foreign firms and have invested in 43% of all Asian unicorns.\textsuperscript{96}

\section*{Capital}

The funding of FinTech businesses is another key indicator of the importance and scale of FinTech hubs. The largest investments last year were in the Americas, soaring to a record $54.5 billion, with the US accounting for $52.5 billion.\textsuperscript{97} Investment was driven primarily by M&A activity with a large number of megadeals worth over $100 million. The payments space continued to attract the attention of investors, who were particularly interested in embedding payments functions into other technologies because of these functions’ potential applicability across less digitally advanced sectors such as healthcare.\textsuperscript{98} In this regard, the US has seen a boom in investments in InsurTech: the use of technological innovation in

\textsuperscript{92} Financial Stability Board, \textit{FinTech and Market Structure in Financial Services}, 15.
\textsuperscript{94} D. Ferenzy, \textit{A New Kind of Conglomerate: Bigtech in China}, Institute of International Finance (November 2018), 22.
\textsuperscript{95} Ibid., 23.
\textsuperscript{96} \textit{The Economist}, ‘FAANGs v BATs: America’s Tech Giants Vie With China’s in Third Countries: The Most Titanic Commercial Battle in the World’, 5 July 2018.
\textsuperscript{97} KPMG, \textit{The Pulse of FinTech 2018}, 23.
\textsuperscript{98} Ibid., 34.
the insurance sector, from healthcare to automotive and home insurance.99

Europe is the region with the second-largest investments, amounting to $34.2 billion in 2018, with the UK dominating the FinTech space. Some interesting trends here are the consolidation of the market through M&A and the rise of ‘challenger banks’: small, recently created banks that compete with their traditional counterparts. Examples of challenger banks are Monzo and Revolut in the UK, and N26 in Germany. In the past year the push towards open banking—the banking practice that allows third-party financial service providers to access customers’ financial data100—has also been driving investments in Europe.101

In 2018 FinTech investments in Asia were $22.7 billion, more than half of which came from a single, record-setting megadeal.102 Seeking to fund its global push, Ant Financial raised $14 billion last year in the world’s largest venture capital round ever.103 Then, in a deal worth $700 million, Jack Ma’s financial services giant agreed earlier this year to buy the British payments group WorldFirst, which provides international money transfers and currency exchange.104 Finally, last year Tencent made direct investments in the German N26.105 Global expansion and investment are thus becoming the major trend in the region and a top priority for the Chinese FinTech and BigTech companies.

**Talent**

The availability of talent is another determinant in the development and significance of FinTech hubs, which have to be able to attract, develop and retain people with the requisite training and abilities.106

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102 Ibid., 57–8.
Despite the growth of the industry, stakeholders are increasingly seeing this as one of the main challenges facing FinTech companies. Some FinTech hubs appear to have access to large talent pools. This is especially true of those in the US, such as New York and San Francisco, but it also holds for London and Beijing. With the recognition of the importance of talent, some countries are attempting to attract people with technical expertise from other countries. The UK, for instance, has the Tech Nation Visa, which enables talent from across the world to work in the UK’s digital technology sector. Estonia and Lithuania have introduced visa programmes aimed at both the non-EU founders of start-ups and the employees of these new businesses. Hong Kong has its FinTech Career Accelerator Scheme, a government-led programme that places highly educated students in FinTech start-ups, financial organisations and regulatory authorities. The Chinese BigTechs are also competing aggressively for skilled talent, poaching it internationally.

**Regulation and government policies: what is best for the EU?**

Progressive regulation and favourable government policies appear to be one of the key elements in the FinTech success formula. As such they will continue to shape the FinTech landscape in the future.

Given the various risks associated with the new technology and the new business models that are emerging, it is important for regulators and governments more generally to strike the right balance between their support and endorsement of innovation, on the one hand, and consumer protection and financial stability, on the other. While regulation is generally considered an impediment to development

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and new market entrants, there are various examples of how regulation done right can drive innovation.\textsuperscript{112} For instance, to increase competition and enable the rolling out of new FinTech, countries are pushing for open banking. This is an open standard for Application Programming Interfaces (APIs), which gives customers more control over their data and makes it easier for FinTech companies or other businesses to make use of bank data on behalf of customers.\textsuperscript{113}

With the revised Payment Services Directive (PSD2), the EU is setting a good example here.\textsuperscript{114} The directive mandates that banks have to transfer customers’ data to third parties when directed to do so by the customers.\textsuperscript{115} In combination with other pieces of legislation on reporting requirements and data protection, this has made the European financial sector more open to innovation, especially in connection with data-centric and data-driven solutions.\textsuperscript{116} These policies have also increased interest and investment in RegTech, which is the use of innovative technology by both financial institutions and regulators in the contexts of regulation and monitoring, reporting and compliance, consumer protection and Anti-Money laundering/Combating the Financing of Terrorism (AML/CFT).\textsuperscript{117} These dynamics are increasingly having spillover effects globally, because they are having an impact on companies around the world that interact with EU markets.\textsuperscript{118} For example, Chinese BigTech companies’ expansion into European markets has been relatively limited because of this.\textsuperscript{119} Moreover, the European experience can serve as a roadmap for other jurisdictions, which are increasingly recognising the need for regulation in the nexus of finance and technology.\textsuperscript{120} This growing awareness is in evidence especially in the US and China, where the low regulation environment has made markets more oligopolistic, in the sense that

\begin{itemize}
  \item UK Open Banking Working Group, \textit{Unlocking the Potential of Open Banking to Improve Competition, Efficiency and Stimulate Innovation}, UK Payments Forum (2016), 3.
  \item Zetzsche et al., \textit{The Future of Data-Driven Finance and RegTech}, 49.
  \item Zetzsche et al., \textit{The Future of Data-Driven Finance and RegTech}, 5.
  \item Ferenzy, \textit{A New Kind of Conglomerate}, 27.
  \item Ibid., 49–50.
\end{itemize}
they are dominated by a small group of BigTech firms.  

To nurture their FinTech landscapes, different jurisdictions are implementing varied policies and initiatives, which could serve as best practices for the EU. To support the FinTech industry, and facilitate interaction and collaboration with innovative financial players, regulators are launching innovation hubs (‘an information exchange regime on fintech matters’) and regulatory sandboxes (‘live testing of new products or services in a controlled environment’). Most European regulators have already been catching up on this development. Singapore, another progressive regulatory country, has been supporting DLT development in an effort to become the world’s leading blockchain development hub. The Monetary Authority of Singapore organises the Singapore FinTech Festival and runs its own accelerator programme, Global FinTech Hackcelerator, which brings together start-ups from around the world. The US, on the other hand, has been less welcoming to foreign FinTech companies, taking a more protectionist approach. Last year the Committee on Foreign Investment in the United States, citing national security concerns, blocked, among others, Ant Financial’s $1.2 billion acquisition plans for MoneyGram. China’s more holistic approach to FinTech is also interesting. The government has put in place a wide range of measures aimed at putting digitalisation and innovative technologies at the heart of its five-year development plans. Despite the gradual shift towards a more regulated FinTech industry there, it has direct and open government support through, for example, financing via state-owned investment funds and government subsidies, which have been instrumental in a large part of the industry’s growth.

It will be clear, then, that to stimulate innovation and create a competitive and healthy FinTech ecosystem, policymakers need to place the emphasis not on the regulation of technological innovation itself, but rather on the regulation of competition in the financial markets.

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121 Zetzsche et al., The Future of Data-Driven Finance and RegTech, 6–7.
124 Mittal, FinTech Ecosystem Playbook, 13.
The current EU policy approach
The dynamic and growing FinTech sector in Europe is certainly attracting policymakers’ interest. At the EU level more attention is now being paid to the role of technological innovation in increasing efficiency, strengthening financial integration and enhancing the EU’s role in financial services, while also protecting customers. For the moment, however, the landscape remains rather fragmented, which can both prevent businesses from expanding across borders and create an uneven playing field. Harvesting the full potential of the FinTech industry in Europe would require scaling up by taking advantage of the whole European market and increasing companies’ global competitiveness. In terms of current policies, there is a combination of EU-wide legislative measures that have created a unique momentum for the digital transformation of Europe. These include robust regulatory reporting requirements under the Alternative Investment Fund Managers Directive (AIFMD) and Markets in Financial Instruments Directive II (MiFID II), rigorous data protection under the General Data Protection Regulation (GDPR), an open banking regime under PSD2 and a pan-European digital identity framework on the basis of eIDAS (electronic IDentification, Authentication and Trust Services). These efforts, however, have not been the product of an overall strategy to further the integration and development of the financial sector or to enhance the disruptive capacity of FinTech in Europe. Indeed, there is currently no overarching legislation that covers all aspects of FinTech.

Against this background the European Commission has taken steps towards a more coherent approach to the policy debate, with the FinTech Action Plan announced in March 2018. It encompasses 19 concrete steps to promote the scaling-up of innovative business models and the uptake of new technologies; to enhance security in and the integration of the financial sector; and to strengthen

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129 Ibid., 108.
135 Zetzsche et al., The Future of Data-Driven Finance and RegTech, 12.
136 Karakas and Stamegna, ‘Defining an EU-Framework for Financial Technology (FinTech)’, 111.
consumer, investor and data protection.\textsuperscript{137} Furthermore, the Action Plan is designed, first, to encourage collaboration between business and both national and European-level institutions, including the European Supervisory Authorities.\textsuperscript{138} Second, it is designed to promote regulatory certainty and convergence in a more future-oriented regulatory framework, where ‘innovative FinTech products and solutions can be rapidly rolled out across the EU to benefit from the economies of scale of the single market, without compromising financial stability or consumer and investor protection’.\textsuperscript{139}

The main theme of the European regulatory and supervisory approach to FinTech seems to be cooperation: both between businesses and institutions, and between the different national regulators. Innovation facilitators are starting to take off. Currently, there are 6 regulatory sandboxes and 26 innovation hubs across the European Economic Area states.\textsuperscript{140} This reflects the proactive approach that regulators have taken to encouraging cooperation and interaction with businesses.\textsuperscript{141} Recently, the European Supervisory Authorities published a joint report on these innovation facilitators in different European jurisdictions, aiming to encourage transparency, cross-border knowledge sharing and collaboration among regulators.\textsuperscript{142} At the EU level, the Commission has established an EU FinTech Lab, where regulators and supervisors meet technology providers to discuss the technology behind the innovative products and solutions, and to address the regulatory and supervisory concerns associated with it.\textsuperscript{143} Another EU initiative is the recently launched European Forum for Innovation Facilitators, which is meant to improve cooperation among and the coordination of national regulatory bodies.\textsuperscript{144}

The role of policymakers and supervisors is undoubtedly crucial for fostering the right conditions for enabling the uptake of FinTech in Europe. Nevertheless, the great number of these institutions and initiatives at the national and EU levels arguably creates a network that is fragmented and overly complex.

\textsuperscript{138} European Banking Authority, European Securities and Markets Authority, and European Insurance and Occupational Pensions Authority.
\textsuperscript{142} Joint Committee of the European Supervisory Authorities, \textit{FinTech: Regulatory Sandboxes and Innovation Hubs}, 37–9.
\textsuperscript{143} European Commission, ‘First Meeting of the EU FinTech Lab’ (2018).
\textsuperscript{144} European Commission, ‘Daily News 02/04/2019’.
If we are to have effective and efficient policymaking and regulation, a higher degree of coordination is needed.\textsuperscript{145} As outlined in the previous sections, regions outside Europe are emerging as major FinTech hubs in terms of investment and the scale of their businesses. European FinTech companies are comparatively smaller, with a large number of start-ups with fewer than 10 employees. They are also ‘younger with an average age of 6.5 years compared to 9.8 in the US and 8.5 in India’.\textsuperscript{146} Without favourable government initiatives and support, it would be challenging for them to compete with BigTech giants in the US and China. Moreover, the previously mentioned trends in investment in the EU FinTech market suggest that European start-ups are likely to be acquired by larger firms. Meanwhile, Chinese BigTechs are aggressively expanding abroad and are already making direct investments in EU companies. At this stage of FinTech development, it would be difficult to assess the competition issues that could arise, both in Europe and globally, as a result of these developments. Nevertheless, it is obvious that a targeted, consolidated and timely approach at the EU level is needed. If the EU wants to nurture its smaller FinTech firms and allow them to benefit from the single market, overcoming the fragmentation of national approaches to legislation and regulation will be imperative. Staying competitive in the fast-moving and adaptive financial sector will depend on whether the technology disruption happens at the EU or national level and on who leads it.


\textsuperscript{146} A. Fraile Carmona et al., \textit{Competition Issues in the Area of Financial Technology (FinTech)}, Directorate-General for Internal Policies, Department for Economic, Scientific and Quality of Life Policies, PE 619.027 (July 2018), 12.
Policy recommendations
• Just as FinTech innovation is customer-oriented, policymakers should also put customers at the heart of their legislation and regulation. In an increasingly data-driven and data-centred industry, customers’ financial data is becoming the new currency that is ‘financing’ new business models, especially for new systemically important players such as BigTechs. To avoid data becoming concentrated in the hands of a few companies, regulators should step in and define data gathering and analytics as a regulated activity in the financial sector. When the data collected exceeds a certain threshold—for example, when the percentage of the entire population it involves is greater than a specified limit—regulators need to have access to these data-based business models to analyse them with a view to risk and fairness. If necessary, they should intervene to ensure sound market competition without stability and customer protection being compromised.

• Regulating competition rather than technology is strategically important for fostering an enabling environment in which innovative companies can scale up across the entire EU and roll out new technologies. Having looked at the global FinTech landscape and the emerging major players, Europe can focus on policies that help its own FinTech start-up companies to compete and collaborate with traditional financial institutions and foreign technology giants for the purpose of providing better financial products and services to end-users. In Europe these companies would benefit from the economies of scale of the EU single market, which would also enhance their global competitiveness.

• The new technologies could also contribute substantially to the full integration of the current market infrastructure. This would accelerate the completion of the Capital Markets Union, a point acknowledged in the Commission’s FinTech Action Plan. This would necessitate overcoming the FinTech fragmentation along national lines through a holistic, overarching EU-wide approach to both legislation and regulation. By creating a common, more centralised framework, the EU would not only tackle the different, sometimes even diverging, national approaches to FinTech, but would also create more certainty and trust in the common market.

• Concerning strategy, the EU could focus on harnessing the technologies with the highest disruptive capacity with the goal of becoming a global leader in the fast-moving FinTech sector. Innovations in payments and transactions could lead the way. However, not only in the financial industry, but also in society in general, there is a growing recognition of the transformative potential of big data analytics,
AI and DLT. RegTech is another innovation with the potential to be adopted on a broad scale across Europe. To cultivate a FinTech market and FinTech businesses in Europe that are competitive globally, a proactive attitude and targeted initiatives are required on the EU level. Such initiatives would include investing in the new technology and exploring its applications; encouraging cooperation between businesses and regulators; and developing the essential skills among companies, consumers and competent authorities.

• Finally, if it is to maintain its competitive edge, the EU cannot afford to hesitate and lose time when it comes to creating Union-wide legislation. Drafting and implementing this legislation could take several years, and in a fast-paced, innovation-driven sector such as FinTech, it is crucial to move quickly. While a balanced and well-researched approach takes time, a clear message about the EU’s efforts in this direction needs to be sent to the sector, both European and global, especially about the Union’s willingness to collaborate with it, while also safeguarding its core market principles.
Conclusion
The fast-paced and constantly evolving FinTech landscape has created new financial market dynamics globally. With their large technology companies increasingly on the forefront of these developments and aggressively expanding operations abroad, the US and China are establishing themselves as global FinTech centres. To stay competitive in the financial industry, the EU would have to keep up with the technological advancements. To that end, designing forward-looking policies and unlocking the disruptive potential of FinTech solutions in Europe would entail striking the right balance between nurturing the development and uptake of new technologies and safeguarding both financial stability and the protection of customers and investors.

The EU has already undertaken certain measures and initiatives in this direction, but at the moment it lacks a targeted, overall approach to FinTech legislation and regulation. A new strategic framework needs to be developed at the EU level, one that focuses on fostering a FinTech enabling environment in which innovative businesses and technology can thrive and deliver better financial products and services to consumers.
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The term ‘financial technology’ (FinTech) refers to technology-enabled innovation in the financial sector. FinTech could result in new business models, products and services. It has been rapidly developing around the world, offering innovative products and services that are quickly gaining traction with consumers and investors. Different countries and regions around the world are finding themselves caught up in this fast-paced ecosystem, where their competitiveness depends on a variety of factors, including the interaction of different market players, access to funding and talent, and regulatory measures. This paper examines the latest developments in specific financial technologies, major financial services and product providers. It also looks at the conditions which are shaping financial centres’ competitive significance in FinTech on a global scale.

Recent trends suggest that the US and China are emerging as key hubs for unlocking the disruptive potential of financial innovation in terms of the scale of their FinTech businesses and investments compared to Europe. For the comparatively smaller and younger European FinTech companies it would be challenging to compete with them without favourable government initiatives and support. The EU has already undertaken certain measures and initiatives in order to nurture its FinTech firms, but at the moment it lacks a targeted, EU-wide approach to FinTech. The policy landscape remains rather fragmented with different national approaches to legislation and regulation. The paper examines the current EU policies, initiatives and frameworks for the purpose of providing forward-looking policy recommendations for a more competitive and innovative single European market in the financial sector.