

EUROPEAN ECONOMY

BANKS, REGULATION, AND THE REAL SECTOR

FINTECH AND BANKING. FRIENDS OR FOES?

FROM THE EDITORIAL DESK

FinTech and Banks: Friends or Foes? by Giorgio Barba Navaretti, Giacomo Calzolari
and Alberto Franco Pozzolo

Numbers by José Manuel Mansilla-Fernández

Institutions by José Manuel Mansilla-Fernández

A Bird Eye (Re)view of Key Readings by José Manuel Mansilla-Fernández

ARTICLES

Digital Disruption and Bank Lending by Jean Dermine

The Future of Banking: From Scale & Scope Economies to Fintech by Arnoud W.A. Boot

The Impact of Fintech on Banking by Xavier Vives

The Big Promise of Fintech by Marcello Bofondi and Giorgio Gobbi

Regulating FinTech: Crowdfunding and Beyond by Guido Ferrarini

China's Path to FinTech Development by Xiao Xiang, Zhang Lina, Wang Yun and Huang Chengxuan

017.2

Fintech and Banking. Friends or Foes?

What is European Economy

European Economy – Banks, Regulation, and the Real Sector (www.european-economy.eu) is an on-line journal to encourage an informed and fair debate among academics, institutional representatives, and bankers on the regulatory framework and its effects on banking activity and the real economy. It is an independent journal, sponsored by Unicredit Group.

The journal aims at becoming an outlet for research and policy based pieces, combining the perspective of academia, policy making and operations. Special attention will be devoted to the link between financial markets and the real economy and how this is affected by regulatory measures. Each issue concentrates on a current theme, giving an appraisal of policy and regulatory measures in Europe and worldwide. Analysis at the forefront of the academic and institutional debate will be presented in a language accessible also to readers outside the academic world, such as government officials, practitioners and policy-makers.

This issue of European Economy examines the impact of Fintech on banks. Digital innovations and technology based business models could provide new business opportunities for incumbents, by transforming how they create value and deliver products and services. Or they could disrupt the existing structure of the financial industry, by blurring its boundaries and fostering strategic disintermediation. By providing new gateways for entrepreneurship, Fintech can ease the access to financial services, fostering competition by new players. To survive, incumbent banks will have to react, face rising competitive pressure and adopt new strategies. What will be the implications for their business models? How will the banking industry evolve with Fintech? And, similarly important, what are the implications for financial sector regulation?

EUROPEAN ECONOMY
BANKS, REGULATION, AND THE REAL SECTOR
YEAR 3 - ISSUE 2

CHIEF EDITOR

Giorgio Barba Navaretti, *University of Milan*

EDITORS

Giacomo Calzolari, *University of Bologna*

Alberto Franco Pozzolo, *University of Molise*

EDITORIAL COORDINATOR

José Manuel Mansilla Fernández, *University of Milan*

ADVISORY BOARD

Elena Carletti, *Bocconi University*

Ralph De Haas, *EBRD*

Alberto Giovannini, *ESRB*

Guido Ferrarini, *University of Genova*

Ivanohe Lo Bello, *Confindustria*

Gianmarco Ottaviano, *London School of Economics and University of Bologna*

Jean Charles Rochet, *University of Zurich*

Salvatore Rossi, *Banca d'Italia*

Fabiano Schivardi, *Bocconi University*

Dirk Schoenmaker, *Rotterdam School of Management and Bruegel*

Nicolas Véron, *Bruegel and Peterson Institute for International economics*

GRAPHIC PROJECT

Claudio Patriarca

European Economy – Banks, Regulation, and the Real Sector
is an online publication of the Review of Economic Conditions in Italy magazine.
Accessible free of charge at: www.european-economy.eu

Registrazione del Tribunale di Roma n. 13977 del giugno 1971

PUBLISHED BY

Europeye srl

via Gregorio VII, 368 - 00165 Roma

t. 06 3700556 - www.europeye.com

ISSN 2421-6917

Table of Contents

FROM THE EDITORIAL DESK

| | |
|---|----|
| FinTech and Banks: Friends or Foes? | 9 |
| by Giorgio Barba Navaretti, Giacomo Calzolari, Alberto Franco Pozzolo | |
| Numbers | 31 |
| by José Manuel Mansilla-Fernández | |
| Institutions | 41 |
| by José Manuel Mansilla-Fernández | |
| A Bird Eye (Re)view of Key Readings | 51 |
| by José Manuel Mansilla-Fernández | |

ARTICLES

| | |
|---|-----|
| Digital Disruption and Bank Lending | 63 |
| by Jean Dermine | |
| The Future of Banking: From Scale & Scope Economies to Fintech | 77 |
| by Arnoud W.A. Boot | |
| The Impact of Fintech on Banking | 97 |
| by Xavier Vives | |
| The Big Promise of Fintech | 107 |
| by Marcello Bofondi and Giorgio Gobbi | |
| Regulating FinTech: Crowdfunding and Beyond | 121 |
| by Guido Ferrarini | |
| China's Path to FinTech Development | 143 |
| by Xiao Xiang, Zhang Lina, Wang Yun and Huang Chengxuan | |

From the Editorial Desk

FinTech and Banks: Friends or Foes?

by Giorgio Barba Navaretti, Giacomo Calzolari, Alberto Franco Pozzolo¹

1. Introduction

FinTech hypes abound. In the news, FinTech is “disruptive”, “revolutionary” and armed with “digital weapons”, that will “tear down” barriers and traditional financial institutions (World Economic Forum, 2017).

Although FinTech (see the Box below for a definition) has been expanding very rapidly in financial markets, as documented in the Numbers section of this Journal, the jury is still out, and their potential impact on banks and financial institutions, as we know them today, is far from clear yet. The tension between stability and competition underlies the whole debate on FinTech and on how to regulate it. The crucial question is whether and how far FinTechs are replacing banks and other incumbent financial institutions. And whether, in doing so, they will induce a healthy competitive process, enhancing efficiency in a market with high entry barriers, or rather cause disruption and financial instability. This issue of European Economy deals especially with the relationship between FinTechs and banks.

Our bottom line is that *FinTechs enhance competition in financial markets, provide services that traditional financial institutions do less efficiently or do not do at all, and widen the pool of users of such services. But they will not replace banks in most of their key functions.* In most cases, FinTechs provide a more efficient way to do the same old things. Yet *banks are well placed to adopt technological innovations, and do the old things in the new way themselves.*

1. University of Milan, University of Bologna, University of Molise.

FinTechs provide indeed the same services as banks, possibly more efficiently because of technologies, but in a different and unbundled way. For example, like banks, crowdfunding platforms transform savings into loans and investments. Yet, differently from banks, the information they use is based on big data not on long term relationships; access to services is only decentralized through internet platforms; risk and maturity transformation is not carried out; lenders and borrowers or investors and investment opportunities are matched directly. There is disintermediation in this case. These are pure FinTech activities. *However, these pure FinTech unbundled activities have limited scope.* For example, it is difficult for platforms to offer to their clients diversified investment opportunities without keeping part of the risk on their books, or otherwise securitizing loan portfolios.

Other functions carried out through FinTechs instead of banks, like payment systems (e.g. Apple pay instead of credit cards) are still supported by banks. Banks lose part of their margins, but still keep the final interface with their clients, and because of the efficiency of these new systems, they expand their range of activities. Hence, in this case, *there may be strong complementarities between banks and FinTechs.*

The value chain of banks includes many bundled services and activities. FinTech generally carry out one or few of these activities in an unbundled way. Yet, bundling provides powerful economies of scope. The economics of banking is precisely based on, and has a strong rationale in the ability of banks to bundle services like deposits, payments, lending etc. For this reason, FinTechs will also have to bundle several services if they wish to expand their activities (as for the crowdfunding example above) or integrate their services with those of banks (as for the payment systems above).

The business model of FinTechs, therefore, is highly likely to gradually converge towards that of banks, as we will discuss in this editorial. As this happens, it is no longer clear that FinTechs have a neat competitive advantage on banks, besides for the legacy costs that banks face in reorganizing their business. Moreover, as FinTechs expand their range of activities, the scope for regulatory arbitrage will decline. We share Ferrarini's view in this issue (see also the section on regulation of this editorial below), that a case by case regulatory approach should be implemented, essentially applying existing regulations on FinTechs, on the basis of the service they carry out. Regulation

should be applied when services are carried out (of course with an element of proportionality), independently from which institution is carrying them out.

For example, if we consider again loan based crowdfunding, different regulatory frameworks could be relevant, depending on what these platforms actually do. Banking regulation could be unnecessary, if platforms do not have the opaqueness of banks in transforming risks and maturities and do not keep such risks on their balance sheets, for example by collecting deposits and lending outside a peer-to-peer (P2P) framework. But it should be enforced if platforms carry out such activities.

Once regulatory arbitrage is ruled out, and the same regulatory framework is imposed on all institutions on the basis of the functions they perform, the playing field is levelled. Then the only competitive advantage is the one granted by technology and the organization of activities. The framework becomes one of pure competition with technological innovation. Vives in this issue discusses several competitive options banks and FinTechs face. We also discuss this at length in section 3 of this editorial.

Cases of entrants with digital innovations and their disruptive effects abound in sectors affected by digital technologies. Netflix caused the “bust” of Blockbuster and Amazon that of many retailers and booksellers. Skype took 40% of the international calls markets in less than ten years. For the incumbents the deadly mix of the newcomers was lower-costs higher-efficiency with better or new products and services, “sprinkled” with incumbents’ inability to swiftly account and adapt to the changing landscape.

Although evocative, these examples do not fit precisely the financial industry. This is significantly different because banking is multiproduct, with largely heterogeneous customers, intrinsically plagued by asymmetric information and heavily regulated.

Competition will enhance efficiency, bring in new players, but also strengthen the resilient incumbents, able to play the new game. Intermediation will keep being a crucial function of financial markets. Intermediation will partly be carried out in a different way than today: much more internet and internet platforms; much more processing of hard information through big data. But banks will not disappear. If some do, they will be replaced by other, more efficient ones. The real casualties will not be banking activities, but mostly small banks and banking jobs.

We will develop further our arguments in the rest of this editorial. In the next section, we will first discuss the key economic ingredients characterizing banking activities, and how they might be affected by FinTech, in particular with respect to maturity and risk transformation, payment systems and the management of information. In the following section, we will compare the revenue models and the incentive frameworks characterizing the activities of banks and FinTechs and how these may affect their competitive prospects. We will finally conclude with a discussion on regulation.

Box 1: What is FinTech

Fintech refers to the novel processes and products that become available for financial services thanks to digital technological advancements. More precisely, the Financial Stability Board defines fintech as "*technologically enabled financial innovation that could result in new business models, applications, processes or products with an associated material effect on financial markets and institutions and the provision of financial services*".²

The areas of actual and potential expansion of Fintech are: a) transactions execution (payments, clearing and settlement); b) funds management (deposit, lending, capital raising and investment management); and c) insurance.

The ability to impact on essentially all the services typically offered by traditional financial institutions, such as banks, comes from cost reductions implied by digital technology advancements, improved and novel products for consumers and limited regulatory burden. More specifically, with technological advancements Fintech operators benefit from: i) lower costs of search that enable matching in financial markets more effectively, ii) economies of scale in collecting and manipulating large bunches of data, iii) cheaper and more secure transmission of information, iv) lower costs of verification.

2. The economics of FinTech and banks

A bank is an institution whose current operations consist in granting loans and receiving deposits from the public (Freixas and Rochet, 2008). This entails

2. See <http://www.fsb.org/what-we-do/policy-development/additional-policy-areas/monitoring-of-fintech/>

performing simultaneously three sets of activities: transmuting the characteristics of financial assets and liabilities, providing payment services, collecting and processing information (see Dermine, in this issue, for a thorough analysis of the impact of Fintech on many different financial services).

Transmuting the characteristics of financial assets and liabilities is mainly realized through *maturity transformation*, that is the use of short-term funding to grant long-term loans. This function is crucial to any economic system, since it allows to fund long-term investments, and therefore foster productivity, while at the same time insuring depositors from idiosyncratic liquidity shocks. Because of their function in providing liquidity to their customers, banks are also well placed in offering *payment services*.

Information processing includes all the activities related with the ex-ante screening of potential borrowers, with the ex-post monitoring of their behavior, and with the construction and management of a diversified portfolio that maximizes the return to risk ratio.

Economies of scope justify the internalization and bundling of all these key services within the boundaries of one institutions. They provide a core rationale for banks' existence.³

We therefore need the perspective of each of these three key services to understand the impact of FinTech on the banking industry. We will discuss them in turns.

a) Credit and liquidity risk

The first key task of banks is to transmute the characteristics of financial assets and liabilities, in particular through maturity transformation. Banks can exploit diversified large pools of small size depositors to cope with the impact of idiosyncratic liquidity shocks. Since it is unlikely that depositors unexpectedly need to withdraw their funds all at the same time, banks can set aside a limited buffer of liquid assets to grant longer-term loans. In synthesis, they can transform short-term sight deposits into long-term loans. This is the essence of banks' ability to provide liquidity services (Bryant, 1980, and

3. Banks also perform a host of other services, such as portfolio management, financial advice, security underwriting and brokerage, but although these may also benefit from economies of scope and are relevant from a revenue perspective, they are not crucial to their specificity as financial intermediaries.

Diamond and Dybvig, 1983). Unless technological innovation will change significantly the way in which maturity transformation is performed, which seems to be unlikely, the interesting question from our perspective is whether FinTech companies can also provide liquidity management services.

The answer is yes and no. Yes, because any FinTech company can raise funds and put them in a pool, from which its clients can make withdrawals when needed. No, because if they use these funds to grant illiquid loans or acquire less liquid assets, they would need a specific authorization. In particular, if FinTech companies raise deposit-like funds to grant illiquid loans, they would be acting by definition as banks, and as such they would be under a bank charter.

Therefore, as long as banks are subject to fractional reserve requirements, they have an advantage in providing liquidity services to their depositors, because they can perform maturity transformation and earn the interest margin.

In a way, FinTech companies providing liquidity services are like 100% reserve or “narrow” banks, with the possible additional weakness that their accounts are not as trustable as those of banks, since the latter are subject to much stricter regulations.⁴ Moreover, bank depositors are also partly shielded by credit risk by capital buffers and deposit insurance. Also, the structure of bank liabilities gives a priority to the holders of some asset classes, such as depositors and bondholders.

Clearly, all this is not the case with FinTech companies, that typically act as brokers, leaving on investors the credit risk of the loans that they grant (unless it is covered externally by an insurance company). While the new discipline on bank resolution increased significantly the share of credit risk on banks’ depositors and other creditors, this has been partly matched by the surge in capital requirements.

Because of maturity transformation, banks also disentangle any loan that they grant from the funding of each single depositor, *obtaining in this way a much better portfolio diversification than what a single depositor could achieve.*

In principle, any financial intermediary could perform these same activities. But while venture capital and private equity firms are typically much better than banks in screening and monitoring opaque entrepreneurs,

4. For a recent survey on fractional reserve banking see Pennacchi (2012).

they normally do not obtain the same degree of portfolio diversification. And while investment funds have very diversified portfolios, they typically invest only in listed shares. If they are based on a pure peer-to-peer (P2P) principle, crowdfunding lending and investment platforms cannot offer any diversification to investors. If they do, then platforms will have to take up part of their risk on their books (hence falling under banking regulation) or act as issuers of securities (then falling under security regulation).

In fact, most of the match-makers currently adopt the so called “agency model”, where they do not retain the risk of the loan that they originate, do not interfere with its price, and receive compensation through commission fees, that may be paid by both sides of the transaction. It is therefore very likely that, for a given portfolio of assets, the riskiness of FinTech liabilities is higher than that of bank deposits and plain bonds. And that, due to their different incentives, FinTech companies are likely to have riskier asset portfolios than banks.

Hence, as far as banks also adopt new information management technologies and regulatory arbitrage is ruled out, the threat to their business coming from this channel of credit and liquidity risk seems limited.

b) Payment systems

Banks’ ability to provide instruments for liquidity and risk management is very much related to their ability to supply payment services. There are obvious and strong economies of scope in providing at the same time liquidity and payment services: customers facing a liquidity need are much better off if they can make payments directly from their deposit account. This is the very reason why checks were originally introduced, and why ATMs and POS followed.

Many payments can be made by transferring value across accounts, with no need of recurring to cash (or other central-bank liabilities, such as bank reserves). In most of cases the transfer is among banks. In fact, even many services that appear to be extremely innovative (e.g. Apple pay) are in fact technological devices that make it easier to transfer value across bank accounts.

But a number of non-bank financial intermediaries are indeed emerging, from payment institutions to electronic money providers. In some countries,

also non-financial corporation, such as telecommunication companies, are entering the market of payment services, exploiting their large base of customers.

In China, for example, telecommunication companies have been offering for years payment services linked to deposit-like accounts, that often paid higher interest rates than deposits at commercial banks. However, to a large extent, this expansion was possible and profitable because of the limited diffusion of bank accounts in China (as in all other emerging economies, see Vives in this issue) and because bank deposits were subject to interest rate ceilings. In most countries, non-financial corporations are not allowed to pay interest rates on their accounts, and there are no interest rate ceilings on bank deposits.

In general, if non-financial corporations or non-bank financial corporations can afford to compete with banks in payment services by paying higher interest rates on their accounts, there must be some kind of benefit that compensates for their inability to exploit the fractional reserve requirements and earn the interest margin granted by maturity transformation. We can think of at least three reasons. First, *lighter regulatory requirements* than banks. The role of telecommunication companies in China is the case in point. Second, *better technologies*, allowing non-banks to provide similar payment services at lower costs. Third, different and more effective *economies of scope* than those available to banks.

The case of regulatory arbitrage is not particularly interesting, since it depends on the decisions of the authorities. As we argue below, the more FinTechs carry out activities similar to banks, and the more they become systemically relevant, the lower there should be room left to regulatory arbitrage.

Technological advantage is relevant in the short-run, when new players can enter the market and exploit their better technologies. But there are no clear reasons why in the long-run banks should not be able to adopt the same technology as non-banks. Of course, banks face huge legacy costs that slow down their transition to new technologies. But as far as technological adoption is fast enough for banks not to lose their network economies, we should expect technological convergence.

The presence of economies of scope between payment services and other business activities that banks cannot replicate is no doubt the most interesting

issue. These economies of scope arise especially between providers of payment services and of other services typically affected by network externalities, like Amazon and Apple in consumption and Google in internet services. To generate these transactions not only the matching must be efficient, but it is necessary that both sides of the market, sellers and buyers, lenders and borrowers, are willing to be “on board”. In particular, there must be a sufficiently large pool of lenders ready to offer funding to borrowers. This is partly the reason why these IT giants are starting to offer payments and other banking services like (indirectly) consumer credit, where economies of scope are huge in information processing: purchases, payments and internet searches alike allow these companies to evaluate the credit risk of their clients possibly better than banks.

Other economies of scope relate to the possibility of extending consumer credit to customers, thereby using interlinked pricing strategies. This is an old game, think for example at the consumer-credit banks owned by the sellers of durable goods like cars. With a customer base such that of Amazon, the potential of this activity expands immensely. Yet this connection is strictly restricted to consumer credit. And if companies start to do consumer credit, they will also face standard regulatory restrictions. Interestingly, Amazon’s store cards, that provide consumer credit, are issued by a consumer financial service bank, Synchrony, which also manages credit scoring and payments.

There might be technological economies of scope to be exploited by linking electronic purchase platforms with electronic payment platforms. Paypal, the largest world supplier of electronic payment services, started its business as a linked service to E-bay, the electronic auction and sale site. However, Paypal offers today services far and above payments on E-bay, most of which are linked to bank or to credit card accounts (also linked to bank accounts). On top of that, Paypal has nowadays a bank charter.

Finally, the digital ledger or blockchain technology would require a separate discussion, beyond the scope of this editorial. Yet we should at least mention digital payments with virtual currencies such as the Bitcoin. Blockchain technologies record any type of digitalized information permanently and virtually with no possibility of manipulation by anyone. This helps in building trust with no need for the State or notaries guaranteeing the actual legitimacy of the transaction and the ownership of the assets

transferred. This certainty and certification of property rights greatly facilitates the commerce and exchanges, building on “automatic, machine based trust”. This is of course an option also to banks, not necessarily only to new comers.

c) Information

The entire financial sector builds on information and information management. Recent developments in ICT have radically changed the way information is processed by financial institutions. As discussed by Bofondi and Gobbi in this issue, these developments have impacts in three different dimensions. First, data storage and processing, because cloud computing allows for the implementation of on demand high level computational capacity at fairly low cost. Second, data transfer through the internet at low cost. Third, data availability, because of the increasing digitalization of society and the economy.

The type of information that financial institutions have and the way they use it to take their decisions is a crucial element to consider in discussing the potential impact of FinTech on banks. FinTechs function on big data and on the standardization of information. Banks, most of the time, on soft and relationship based information. It is also clear that any advancement on information technology profoundly affects the financial sector: FinTech operators are modifying both production and distribution of financial services.

As for the *production of financial services*, a huge mass of personal information is collected and analyzed nowadays. Large client bases and their past behavior allow to predict preferences, needs and trends and to offer the right financial product at the right moment and with the right price. Big data and machine learning are two key ingredients that are dramatically changing the landscape of financial services. Applications and effects on the industry are growing and will be pervasive, from screening potential borrowers to pricing risk at the individual level. Amazon Store Cards boast that they can take instant credit decisions in 15 seconds, something unthinkable through standard means of credit processing.

Distribution of financial services is deeply affected as well, with new channels, personalization, flexibility and better matching. Here, the driver of change is the possibility to match different sides of the market easily and

effectively. Online platforms allow sellers and buyers to screen for the best deals in a process that is more efficient the more populated is the other side of the market, a network externality. At the same time, large information bases allow FinTech provider to assess the characteristics of their customer to implement price discrimination policies.

What matters most for financial applications of tools such as machine learning, big data and matching is the ability to recognize patterns quickly by digging in vast data set, an activity that would be virtually impossible for humans. The idea is not new as even standard regression econometric models can be seen as tools for pattern recognition. The novelty lies in the possibility to rely on extremely large set of data that are explored with more and more powerful computers and algorithms that explore, learn and identify patterns.

There are however *four key questions* concerning the transition to hard information and big data.

A first question is who owns and has access to the information. The screening capacity is based on hard information derived from huge data sets. As stated, the gist of digital innovations is the large amount of data for pattern recognition and the network externalities that are needed for matching and that non-linearly increase with the size of the network, for example in peer-to-peer platforms. If the information is private, only platforms with large client base have a sufficient scale to have such data. And certainly, giant internet companies like Amazon have huge amount of data on which to base their analyses.

Incumbent large traditional operators, such as banks, will also have an informational advantage. It is not clear how far these institutions make use of this information, how far the information itself is already digitalized and how far their ICT facilities allow banks to process this information. Whatever the case, incumbent banks can certainly build up large data bases at a lower cost than new entrants.

Hence, new FinTech entrants will initially suffer from small scale. Naturally, also publicly available information can be used. And regulation may force private owner of information to disclose it to entrants. For example, the new Payments System Directive (PSD2) imposes to banks to release information on their clients' accounts to other financial institutions, on request of clients themselves. Even though these prospects presently refer to

deposits and current account conditions, they might be extended to credit performances and the assessment of borrowers.

However, second question, the processing of hard information has huge legal and social implications, in terms of privacy, in terms of the mechanisms of reciprocal assessment in society, and of cyber risk. The more information and data on the financial behavior of individuals become public, the lower barriers to entry, but also the more we move away from a society where screening occurs through direct economic and social interactions. Understanding the implications of this pattern is beyond the scope of this editorial, but it is very likely that regularly restraints will be set up, specifying to what extent private information may become public and shared. In this respect, who has legitimate channels to be the holder of large volumes of private data (banks on their clients), will also keep being in an advantageous competitive position.

A third question is how far hard data can fully replace soft information. It is clear, for example, that relationship lending is hard to replace in granting credit to small-medium-enterprises (SMEs), with still fairly high degrees of opacity in their accounts and future business prospects. Or in evaluating large investments or loans, involving a large concentration of risk.

This claim could partly be mitigated by the fact that one of the interesting applications of machine learning is the area of natural language recognition and interpretation. For example, the huge amount of lines of texts in social networks could be investigated to identify preferences, desires and attitudes. In the future, this may have very deep consequences in the banking sector as well. Relationship banking is built on human interactions between a loan officer and a prospective borrower. The former is meant to be able to interpret the behavior of the latter and give a meaning and a judgment to the borrower's trustworthiness and other subjective matters. Improving pattern recognition with machine learning, for example in text and verbal communication, could complement (or perhaps replace) this human activity.

Finally, the fourth question concerns the different incentives that banks and FinTechs have in processing information. Banks act as *delegated monitors* for their clients: they screen ex-ante the applications, by evaluating in detail the prospects of the potential borrowers and the value of the collateral that they may be posting; they monitor ex-post their performance along the whole duration of the lending relationship, possibly enforcing covenants capable of

limiting losses in case of default (Diamond, 1984). Thus, they manage the credit risk of the investors, partly holding a share of it in their balance sheets. Moreover, the risk and maturity transformation function carried out by banks, and the inherent structural instability of their balance sheets (risk of bank-runs), provide very strong incentives for better information collection and management than for non-bank institutions, that do not carry out such functions (Diamond and Rajan, 2001). Directly managing credit risk and incentives to collect information seem less strong for many FinTechs, where platforms have an originate and distribute function and do not keep risks on their balance sheet. This different structure may well involve high moral hazard and lower incentives for actively screen investments and monitor ex post performances.

3. FinTech and banks: incentives, competition and regulation

For the reasons discussed above, we believe it is unlikely that FinTech will supplant banks in the long-run: they will probably live together, possibly becoming more and more similar. Here we further explore the competitive context that will likely emerge and how their different business model will coexist, and how far new entrants and incumbents will behave like complements or substitutes, i.e., like friend or foes. To answer these questions, we can consider three major aspects: the funding and revenue structure of FinTechs compared to banks; the sustainability of the unbundling of the banks' product mix and the potential competitive reaction of banks; the role of regulation.

a) Funding and revenue structure

Some of the disintermediated activities of FinTech operators are based on matching supply and demand, as in the digital platforms. As seen, most of FinTech operators have adopted the "agency model" where they do not retain the risk of the loan they originate. Differently, in the traditional "wholesale model" of banking, banks purchase funds from lenders and resell them to borrowers, but keep the credit risk on their books. The difference between these two business models is not only in who bears the risk of the loan, but also in the revenues structure. Banks act on both prices/interest rates paid to

the lender and received by the borrowers and make most of the money from interest rate margins. Digital platforms, instead, make money on fees.

How sustainable is this pure “agency model”? There are two crucial issues here. The first one relates to scale. The second one to the quality of the selection of borrowers.

Scale. To generate disintermediated transactions, matching must be efficient and both sides of the market (borrowers and lenders) must be willing to be “on board”. The ability to match the two sides of the market, the probability of finding a good partner, grows more than proportionally with the size of the two sides. This property is the driver of the dramatic concentration trends experienced in online markets, where companies like Google and Amazon are essentially *winner take all*. Also, lending platforms have high fixed costs and low marginal costs. Thus, they need to operate on a large scale, because fees are paid on each transaction and this is what generates the bulk of revenues (in the US fees accounted to ninety percent of revenues of Lending Clubs in 2017).

Selection of borrowers. Platforms are multi or two-sided markets. Since match-makers need both sides on board, profit maximizing fees must factor in the potential reaction of each side. This requires charging comparatively more on the less elastic side of the market and even subsidizing the most elastic side. This has important implications for the quality of the lending process.

The combination of fee-based profitability, the need for a stable and possibly increasing source of lending and network externalities to cut out small players push lending platforms to broker as many deals as possible, “no matter what”. But, as it is well known from the literature on information asymmetries, this is the perfect receipt for adverse selection on both sides of the market, lenders and borrowers. Moreover, as platforms will charge comparatively higher fees to the borrowers, which are typically less elastic than lenders, the problem of adverse selection will be especially serious for this side of the market.

One sensible solution to avoid this risk is the one recently adopted by the UK platform Zopa, that has announced it will open its own bank. This will allow to rely both on funds originated directly by online deposits, as well as on other traditional banking sources of funding.

But we are back to square one. This strategy brings convergence of FinTechs towards traditional banking.

b) Reacting to Fintechs' competition

Resisting the unbundling of the financial product mix. Many Fintech firms are entering in specific segments of the multi-product financial industry with a business model that, to some extent, is the opposite of universal banking. They operate in single and almost unregulated segments of the industry, and try to stay at latitude from the cost and burdens of banking regulation and compliance (see Figure 12 in the Numbers section, showing that FinTech is more common in countries where banking regulation is more severe).

The risk for traditional banks is that these segments may also be the most profitable ones, such as lending to borrowers with limited market power, and providing payment services and financial advice. This unbundling may be a nightmare for traditional banks, if it leads to a banking industry where the (already) competitive segment of retail banking remains the only realm of banks. They will then be limited to offering an essential, basic facility, very much like the utility industries of water supply, gas and electricity, while the more profitable segments and customers would instead go to FinTechs with few or no layers of intermediation. Figures 9 to 11 of the Numbers section show that indeed investment in FinTechs are higher the lower the level of competition in the banking market.

There are however several hints suggesting that this scenario will hardly emerge, besides for the large economies of scope in bundled activities discussed in the previous section.

First, although retail banking is competitive, it is also an enormous source of cheap funds, explicitly or implicitly protected by public guarantees. This fat part of the market will always provide cheap funds that can be leveraged on other activities.

Second, regulators and supervisors are starting to have Fintech firms under their radar, and for good reasons. Figures from 4 to 7 in the Numbers section show that there is much heterogeneity in the degree of regulatory stringency across services provided by Fintechs and across countries where such services are provided. Consumers' enthusiasm with Fintech may not be coupled with a knowledgeable understanding of the riskiness of Fintech products. Furthermore, the larger the FinTech industry will grow, the more important effects it will have on the stability of the entire financial sector. Despite all the attentions of regulators to avoid chilling the growing of Fintech operators

(see Ferrarini in this issue), we can still reasonably foresee that they will face an increase of their regulatory burden.

Third, traditional banks, at least the largest ones, are not indifferent nor stay put, and already started to incorporate digital innovations in their business models. This is a significant difference with respect to the mentioned cases of digitally-affected industries where incumbents were passive and often incredulous about the risk they were facing. The largest banks seem to have realized that FinTech is not a momentary detail in the history of financial industry, and are therefore reacting. Also, as argued, they have the considerable advantages of large network economies themselves, and the economies of scope of bundled activities.

Small and unspecialized banks will probably be unable to cope with digital innovation with the required intensity and scale (and, in passing, this may lead to another wave of acquisition in the banking industry spurred by FinTech pressure). Large banks will likely be able to absorb and digest the digital innovations and converge towards a new type of operator where many financial services, FinTech and not, are offered together. Buchak et al. (2017), one of the first studies on the impact of FinTech in the banking industry, show that *“(rural) commercial banks lose lending volume and take on riskier borrowers in response to peer-to-peer lending encroachment. Large (urban) bank loan volumes appear to be unaffected by the increase in competition.”* Moreover, a substantial fraction (26.7%) of the peer-to-peer loan volume substitutes for small commercial bank personal loans.

This convergence is not new in the digital industries. Amazon, Apple, Facebook, Google and even Microsoft, they all started in different types of businesses (retail, computers and phones, social network, and search), but they are now converging to a similar set of activities that mix all the initial areas of specialization. Interestingly, most of these conglomerates have already experimented entry in the financial services sector, although with not great success so far. The attitudes of younger customers towards traditional banks suggests that it's a matter of time that these companies will be more successful at offering financial services.⁵ But most likely, they will either focus

5. A multi-year survey by Scratch (an in-house unit of Viacom) shows that 75% of Millennials say they would prefer financial services from Google, Amazon, and PayPal than traditional banks that are also considered more painful than a visit to a dentist. See Baker et al. (2017).

only on targeted products, or they will set up a bank chartered subsidiary.

Resisting the cherry picking of the best customers. Some FinTech firms are entering with low-costs services, often targeting “unbanked” customers, both in developed and developing countries. However, other Fintech firms will target customers with high value for quality of services granting extreme attention to their customers’ needs in terms of accessibility, customization, and speed and with the ability to collect and exploit large amount of personal data. Indeed, Figure 8 in the Numbers section shows that there is a positive relationship at the country level between bank sector development and FinTech.

Also, cherry picking in the banking sector is not new. The effects of entry of foreign banks in the recent history of the banking industry provides some useful insights. Several theoretical and empirical papers have shown that foreign banks tend to “cherry pick” and mainly lend to larger and more transparent firms.⁶ This strategy is the consequence of foreign banks being comparatively better than local banks at monitoring “hard” information (e.g. accounting statements and collaterals), but not so in the case of “soft” information, (e.g. a borrower’s trustworthiness and skills). Notably, this may be the case also for FinTech firms, that very much rely on codified and digitized information, at least as long as the type of digital innovations currently prevailing will continue to shape FinTech firms and their technologies.

What could be the effects of customers’ segmentation in financial markets is difficult to say. Back to foreign banks, evidence is mixed. Some previous works identified an overall increase in lending due to the competitive pressure on domestic banks and the increased risk of takeovers that forced efficiency gains and an expansion of lending to previously unbanked borrowers. Other works instead showed a reduction in lending because the pool of borrowers after the “cream had been skimmed” is riskier, thus facing increased interest rates and reduced demand of loans.⁷

Reacting to the management of digital information. So far, active FinTech firms are mainly exploiting better abilities to match needs. Their impact on the type of collected information and on information management has not

6. Dell’Ariccia and Marquez (2004); Detragiache et al. (2008); Giannetti and Ongena (2012); Gormley (2010).

7. This negative effect is similar to the negative effects of limiting cross-subsidization between different classes of risks in insurance markets.

been dramatic (yet). However, as discussed above, one can envision drastic improvements in FinTech operators' ability to deal with information coming from multiple sources, such as social networks, different media and informal ratings. Will FinTech firms prove effective also dealing with soft information? Will they be able to transform soft into hard information? The consequences on the banking industry may be deep and drastic.

Consider the first stage of development of FinTech. We know that, generally, safer assets are also those that rely less on soft information and tend to be more liquid. Riskier assets, such as credits towards opaque SMEs, are instead based more on soft information and continued monitoring. Currently, FinTech operators are more efficient at managing hard information that can be digitalized, and thus focus more on safer and more standardized assets, such as consumer credit loans and mortgages. They will also leave to traditional operators, like banks, riskier assets that are better managed with soft information, which is difficult to “quantify, store and transmit impersonally” (Liberti and Petersen, 2017). Indeed, Boot and Thakor (2000) show that banks respond to more intense competition with relationship banking, and this is confirmed empirically by Degryse and Ongena (2007). SMEs may thus benefit not only directly from peer-to-peer lending, as discussed above, but also thanks to the competitive pressure the FinTech exert on traditional banks.

If FinTech operators also became better able to manage soft information effectively, this may open the door to the possibility for customers to rely on multiple relationship banking. The typical hold-up and rent extraction of relationship banking (Sharpe, 1990, and Rajan, 1992) will thus be mitigated, and margins from traditional banking business would be further eroded.

But traditional banks have several options to cope this competitive pressure that substantiate with unbundling, cherry-picking and improved information processing. They can renovate their existing IT infrastructure to the new FinTech approaches of information management, to avoid being cornered to the more and more competitive retail banking sector, where FinTech firms and larger digital operators will sooner or later exploit their competitive advantages. They can acquire start-up FinTech firms, to access and learn about the new technologies and to expand the offer to customers and to limit their competitive pressure (although competition authorities will

begin investigating soon such strategies). Alternatively, some large banks can keep relying on their scale and develop internally Fintech-like activities.

While these two different models will very likely coexist for some time, it is our opinion that the future of the financial industry will be shaped by the convergence of surviving incumbent banks and more “organic” FinTech operators.

c) Regulation

Regulation had and is still having a first order effects on the patterns of evolution of FinTech, likely as important as that of technological innovation itself.

The key question from the perspective of regulation is the trade-off between competition and financial stability. The aim of fostering competition in financial markets should lead, in principle, to a lighter regulatory approach than for traditional financial services. Yet, the expansion of FinTech poses implicit concerns in terms of financial stability, that cannot be disregarded.

Bofondi and Gobbi in this issue tackle this question by exploring the evolution of the regulatory framework in the Eighties, when IT and innovation like money market funds were already challenging traditional banking. In those years, the gradual pattern of deregulation, precisely aiming at enhancing competition and efficiency in the financial market, led to the expansion of shadow banking, the undertaking of risky off-balance sheet activities by banks, and finally to the financial crisis of 2008.

Both Bofondi and Gobbi and Vives, also in this issue, argue that an excessively light approach to the regulation of FinTech today may lead to similar consequences. The reason is not only the riskiness of FinTech per se, but also the fact that banks, because of the competitive pressure from FinTechs, might exploit opportunities of regulatory arbitrage and increase the riskiness of their activities. Xiang et al. in this issue explicitly state that *“reviewing and modifying existing regulatory concepts, framework, standards, and tools to adapt to FinTech innovations have become a crucial part [of China’s efforts] to build a modern framework for financial regulation.”*

Especially because of the trend towards convergence between banks and FinTech identified in this editorial, the regulatory framework should level the playing field for overlapping services between FinTechs and traditional

providers. Regulation should then be concerned with the service provided, rather than with whom is providing it. Activities such as innovative payment services are partly unchartered territories, and pose new questions in terms of their regulatory requirements. Other new products, such as P2P lending, should be made at least fully transparent to their users.

The article of Guido Ferrarini in this issue convincingly illustrates that a case by case regulatory approach should be implemented, essentially applying existing regulations on Fintechs, depending on the type of services they carry out. For example, if we consider loan based crowdfunding, different regulatory frameworks could be relevant, depending on what these platforms do. Banking regulation could be irrelevant, if platforms do not have the opaqueness of banks in transforming risks and maturities and do not keep such risks on their balance sheets, for example by collecting deposits and lending outside a P2P framework. But it should be applied if platforms carry out such activities. Equally, if the platform has discretion in selecting potential borrowers or portfolios of borrowers for their clients, then they should be regulated as portfolio managers. And when the platform collects money without resorting to a third-party payment service provider, it should be subject to payment service regulation. Finally, if platforms develop secondary markets for their products, and issue tradable and non-tradable securities, they should be subject to security regulation.

This regulatory approach is not inconsistent with the regulatory framework that most countries are granting to Fintech companies, considered as new types of intermediaries, that should be subject to light regulation. “Sandbox régimes” and FinTech innovation hubs, i.e. periods of targeted light regulation, should be considered as temporary explorative tools to understand the implications of new products and services. The idea is to finalise the appropriate regulatory regime, without “throwing the baby away with the water”.

Whatever the approach, what is crucial is the levelling out of the playing field, avoiding regulatory arbitrage that might lead to serious events of financial instability.

Summing up, the game is still open and the jury is still out. We see FinTech as a crucial healthy evolution of financial markets. Disruption can be avoided. But, as in all times of broad technological transition, a lot of work lies ahead. In the meanwhile, we hope you will enjoy reading this issue of European Economy.

References

- Baker, H.K., Filbeck, G., and Ricciardi, V. (Eds.) (2017). *Financial behavior: Players, services, products, and markets*. Oxford University Press, USA.
- Bofondi, M., and Gobbi, G. (2017). The big promise of FinTech. *European Economy – Banks, Regulation, and the Real Sector*, this issue.
- Boot, A.W.A. (2017). The future of banking: From scale & scope economies to FinTech. *European Economy – Banks, Regulation, and the Real Sector*, this issue.
- Boot, A.W.A., and Thakor, A.V. (2000). Can relationship banking survive competition? *Journal of Finance*, 55, 679–713.
- Boyd, J. H., Prescott, E. C. (1986). Financial intermediary-coalitions. *Journal of Economic Theory*, 38, 211-232.
- Bryant, J. (1980). A model of reserves, bank runs, and deposit insurance. *Journal of Banking and Finance*, 4, 335-344.
- Buchak, G., Matvos, G., Pikorski, T., and Seru, A. (2017). FinTech, regulatory arbitrage, and the rise of shadow banking. NBER Working Paper, No. 23288.
- Degryse, H., and Ongena, S. (2007). The impact of competition on bank orientation. *Journal of Financial Intermediation*, 16, 399-424.
- Dell’Ariccia, G., and Marquez, R. (2004). Information and bank credit allocation. *Journal of Financial Economics*, 72, 185-214.
- Dermine, J. (2017). Digital disruption and bank lending. *European Economy – Banks, Regulation, and the Real Sector*, this issue.
- Detragiache, E., Tressel, T., and Gupta, P. (2008). Foreign Banks in Poor Countries: Theory and Evidence. *Journal of Finance*, 63, 2123–2160.
- Diamond, D. W. (1984). Financial intermediation and delegated monitoring. *The Review of Economic Studies*, 51, 393-414.
- Diamond, D. W., and Dybvig, P. H. (1983). Bank runs, deposit insurance, and liquidity. *Journal of Political Economy*, 91, 401-419.
- Diamond, D. W., and Rajan, R. G. (2001). Liquidity risk, liquidity creation, and financial fragility: A theory of banking. *Journal of political Economy*, 109, 287-327.
- Ferrarini, G. (2017). Regulating FinTech: Crowdfunding and beyond. *European Economy – Banks, Regulation, and the Real Sector*, this issue.
- Freixas, X., and Rochet, J. C. (2008). *Microeconomics of banking*. MIT press.
- Giannetti, M., and Ongena, S. (2012). “Lending by example”: Direct and indirect effects of foreign banks in emerging markets. *Journal of International Economics*, 86, 167-180.
- Gormley, T.A. (2010). The impact of foreign bank entry in emerging markets: Evidence from India. *Journal of Financial Intermediation*, 19, 26-51.
- Liberti, J.M., and Petersen, M.A. (2017). Information: Hard and Soft. Mimeo. Available at: <http://www.kellogg.northwestern.edu/faculty/petersen/htm/papers/hard%20and%20soft%20information.pdf>
- Liberti, J.M., Seru, A. and Vig, V. (2016). Information, credit, and organization. Available at SSRN: <https://ssrn.com/abstract=2798608> or <http://dx.doi.org/10.2139/ssrn.2798608>.

Mocetti, S., Pagnini, M., and Sette, E. (2017). Information technology and banking organization. *Journal of Financial Services Research*, 51, 313-338.

Pennacchi, P. (2012). Narrow Banking. *Annual Review of Financial Economics*, 4, 141-159.

Rajan, R.G. (1992). Insiders and outsiders: The choice between informed and arm's-length debt. *Journal of Finance*, 47, 1367-1400.

Sharpe, S.A. (1990). Asymmetric information, bank lending, and implicit contracts: A stylized model of customer relationships. *Journal of Finance*, 45, 1069-1087.

Vives, X. (2017). The impact of FinTech on banking. *European Economy – Banks, Regulation, and the Real Sector*, this issue.

World Economic Forum (2017). Beyond FinTech: A pragmatic assessment of disruptive potential in financial service. Available at <https://www2.deloitte.com/global/en/pages/financial-services/articles/beyond-FinTech-pragmatic-assessment-disruptive-potential-financial-services.html> (accessed 10/12/2017).

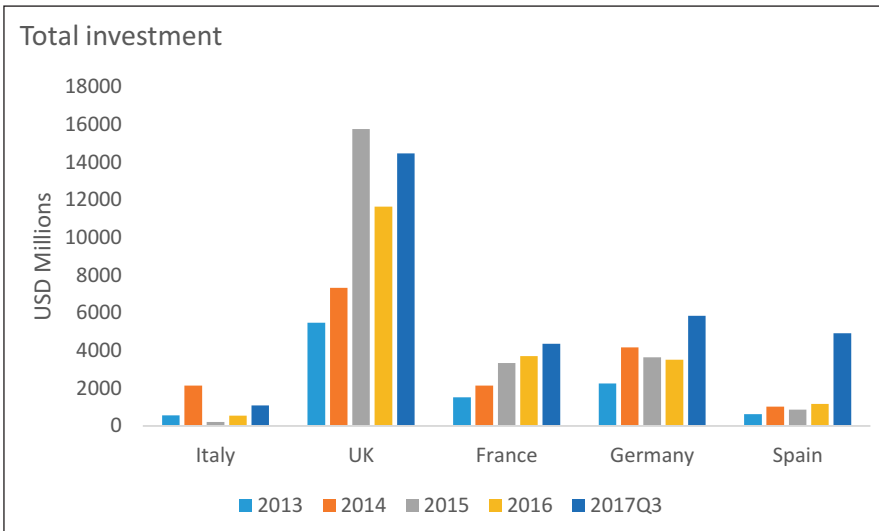
Xiang, X., Lina, Z., Yun, W., and Chengxuan, H. (2017). China's path to FinTech development. *European Economy – Banks, Regulation, and the Real Sector*, this issue.

Numbers

by José Manuel Mansilla-Fernández⁸

FinTech companies in the European countries

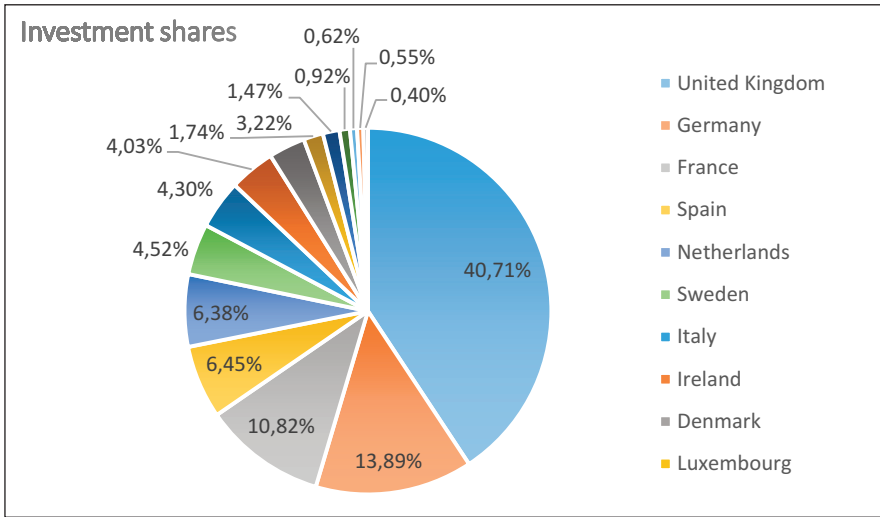
Figure 1: Investment in FinTech companies are increasing in all major European countries although there is much cross-country heterogeneity



Source: Own elaboration based on data from CBInsights (available at: <https://www.cbinsights.com/>). Value of total investment in FinTech companies in each year; data for 2017 refer to the first three quarters only.

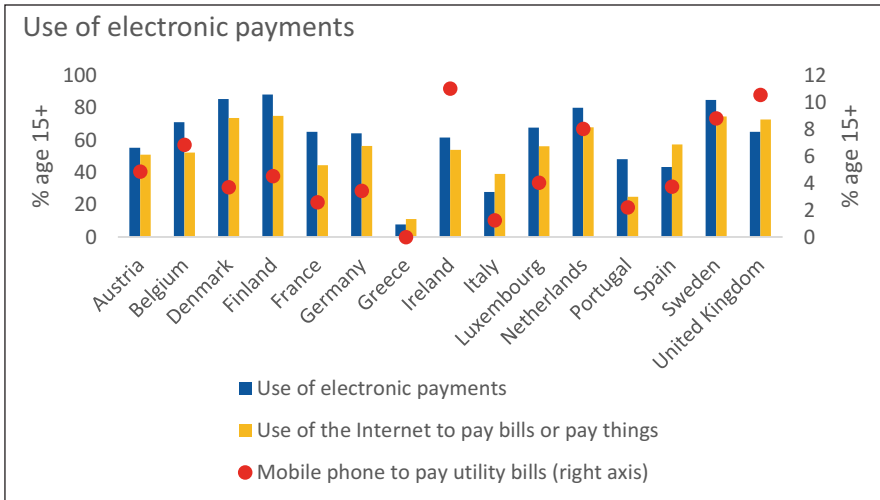
8. University of Milan

Figure 2: Among European countries, the largest proportion of investment FinTech companies is in the United Kingdom



Source: Own elaboration based on data from CBInsights (available at: <https://www.cbinsights.com/>). Country shares of total investment in FinTech companies between 2011Q1 and 2017Q3.

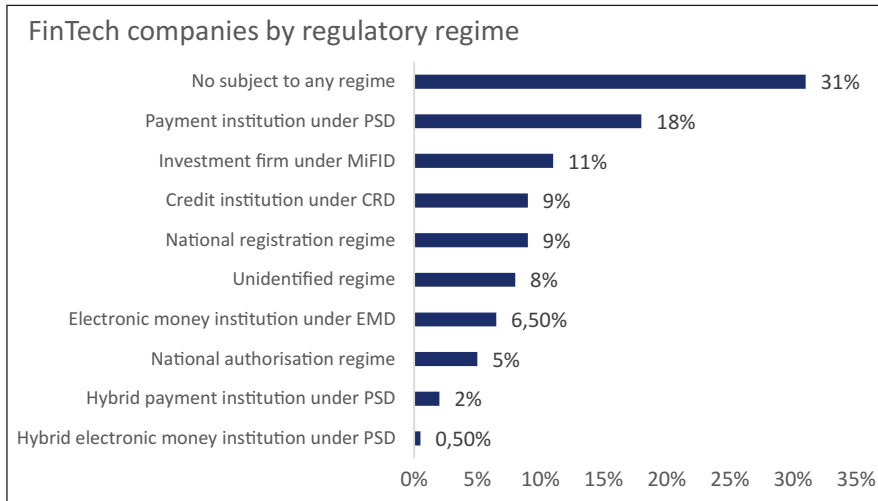
Figure 3: The use of electronic payment technologies is highly heterogeneous across European countries.



Source: Own elaboration based on the World Bank's survey on Global Financial Inclusion (available at: <http://www.worldbank.org/en/programs/globalindex>) database. The vertical axis represents percentage of respondents aged 15 or more. Electronic payments are those initially processed and received electronically, beyond the traditional payments systems provided by the banking industry.

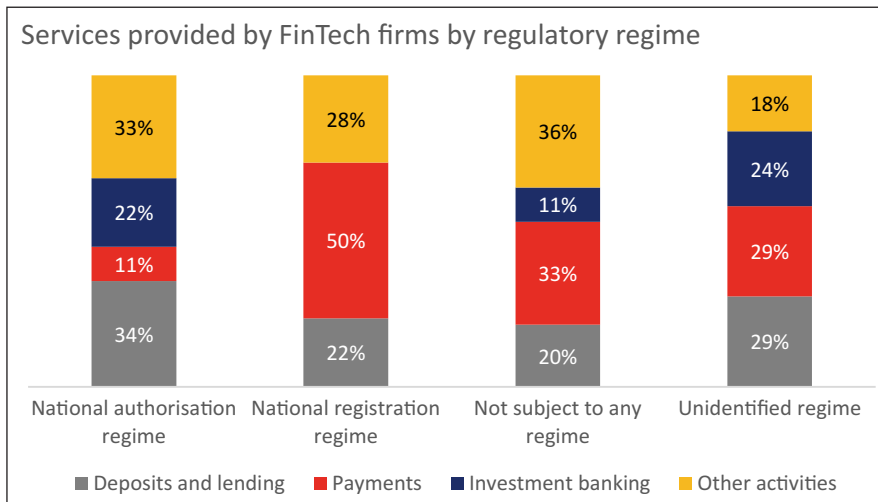
Regulatory status of FinTech companies in Europe

Figure 4: In Europe, most FinTech companies are not subject to any regulatory regime



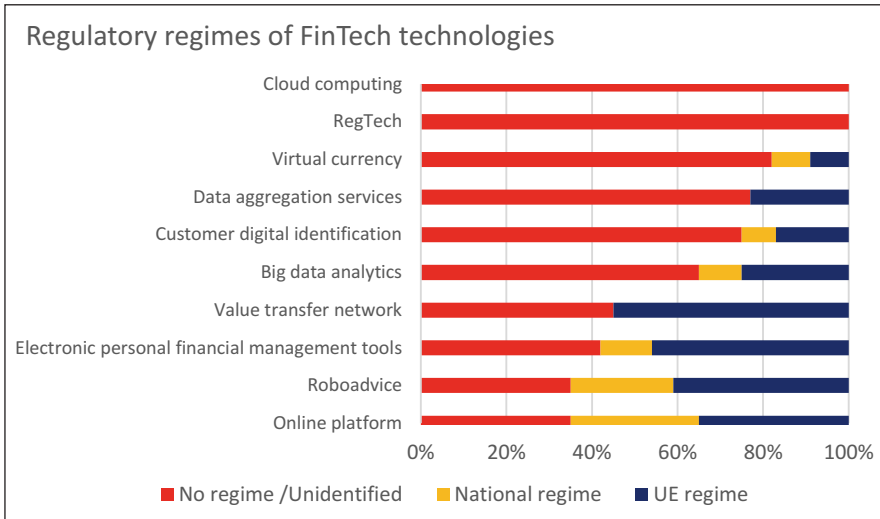
Source: Own elaboration based on the survey run by EBA on 282 European FinTech companies (see EBA, 2017; European Banking Authority, Discussion Paper on the EBA's approach to financial technology (FinTech), EBA/DP/2017/02).

Figure 5: In Europe, the regulatory status of FinTech companies depends on the type of services that they provide



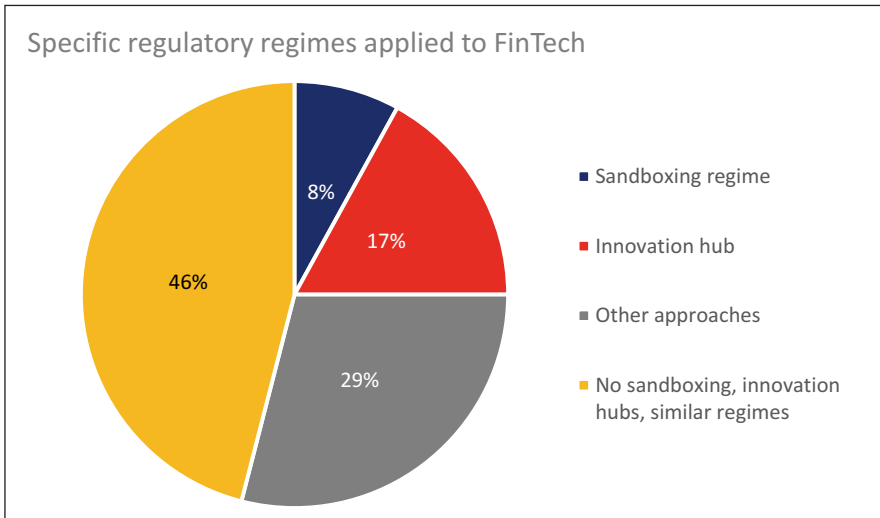
Source: Own elaboration based on the survey run by EBA on 282 European FinTech companies (see EBA, 2017; European Banking Authority, Discussion Paper on the EBA's approach to financial technology (FinTech), EBA/DP/2017/02).

Figure 6: FinTech companies adopting similar technologies are subject to similar regulatory regimes across Europe



Source: Own elaboration based on the survey run by EBA on 282 European FinTech companies (see EBA, 2017; European Banking Authority, Discussion Paper on the EBA's approach to financial technology (FinTech), EBA/DP/2017/02).

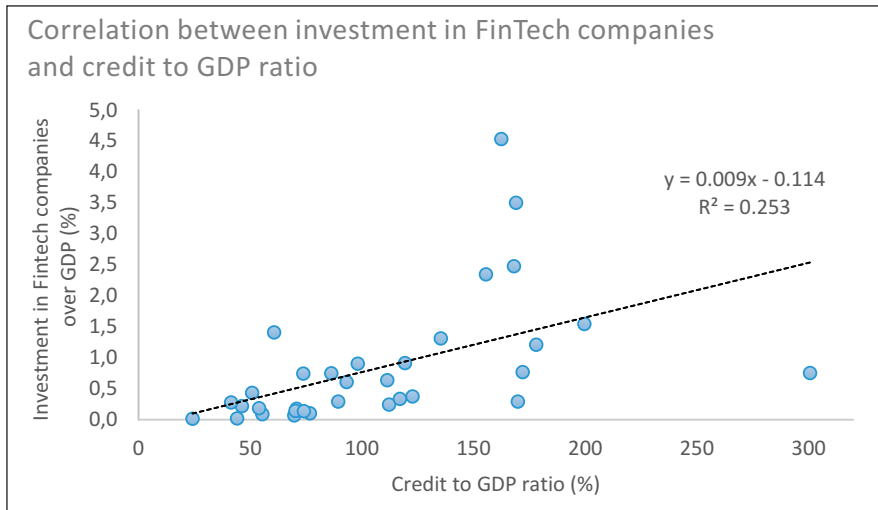
Figure 7: Many European countries apply specific regulatory regimes to FinTech companies



Source: Own elaboration based on the survey run by EBA on 282 European FinTech companies (see EBA, 2017; European Banking Authority, Discussion Paper on the EBA's approach to financial technology (FinTech), EBA/DP/2017/02). Shares of European countries adopting each specific regulatory regime with respect to FinTech activities.

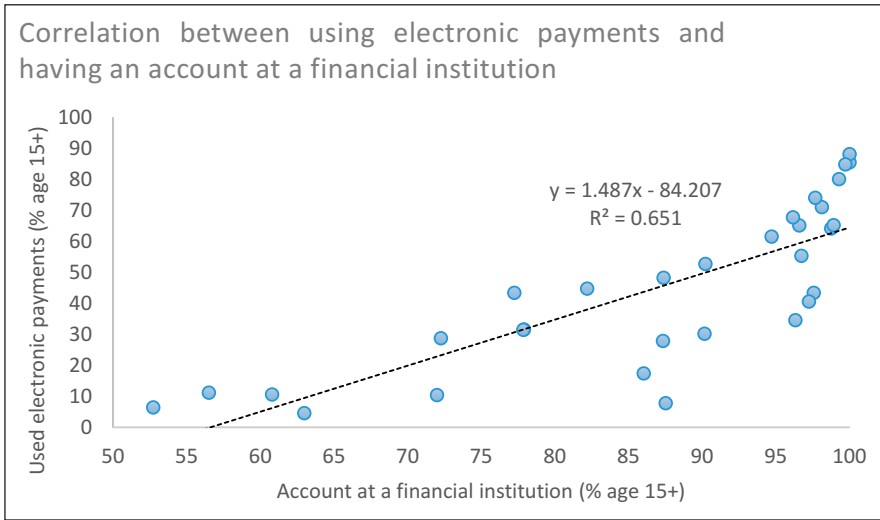
Stylised facts on FinTech and banking

Figure 8: Investment in FinTech companies are larger in more financially developed countries.



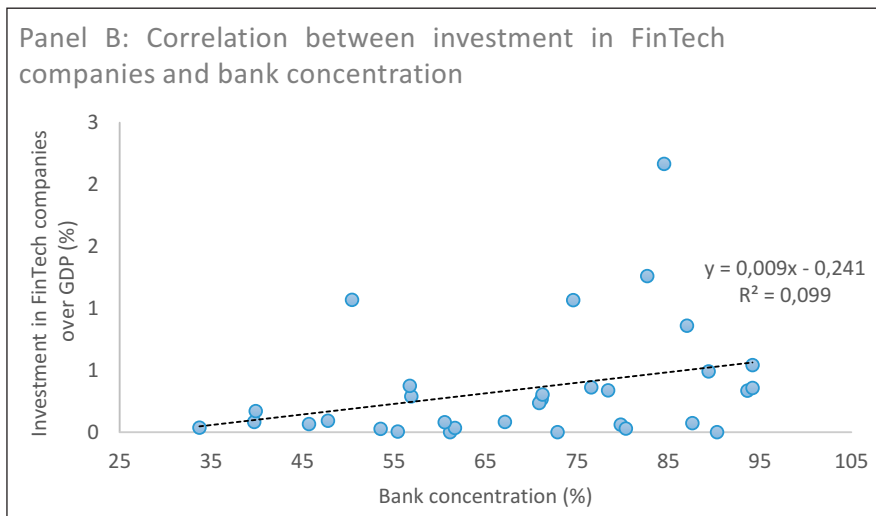
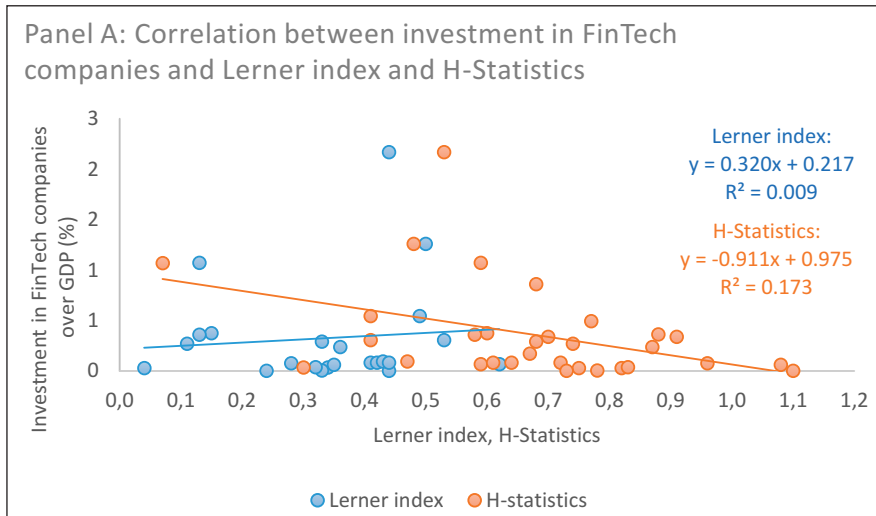
Source: Own elaboration on data from CBInsights (available at: <https://www.cbinsights.com/>) and the World Bank's Global Financial Development Database (available at: <https://datacatalog.worldbank.org/>). Credit to GDP ratio is the total value of credit to the private sector as a percentage of nominal GDP. The sample includes the following countries: Austria, Belarus, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, and United Kingdom.

Figure 9: Use of electronic payments is higher in countries where a higher share of the population holds an account with a financial institution



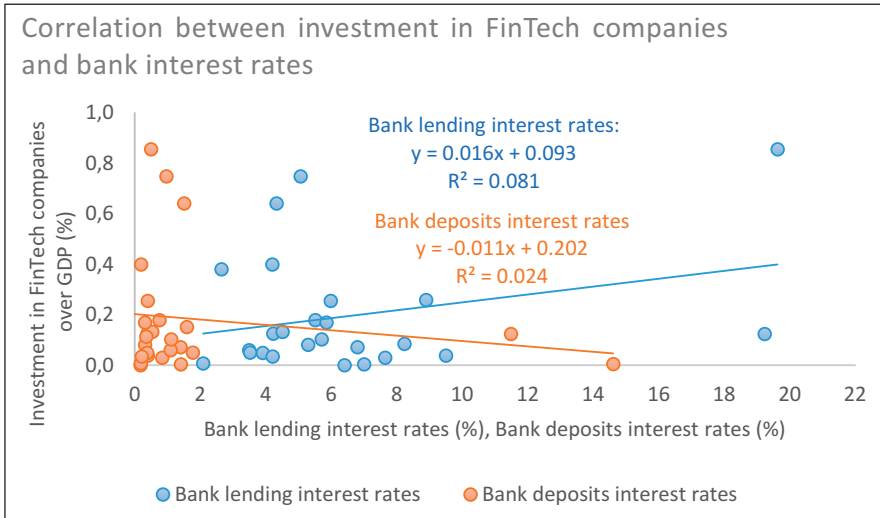
Source: Own elaboration on data from CBInsights (available at: <https://www.cbinsights.com/>) and the World Bank's survey on Global Financial Inclusion (available at: <http://www.worldbank.org/en/programs/globalindex>). Account at a financial institution (% age 15+) is the share of respondents in the country, aged 15 or more, that hold an account at a bank, credit union or another financial institution, or having a debit card. Used electronic payments (% age 15+) is the share of respondents in the country, aged 15 or more, who made payments electronically (see Figure 3 above). The sample includes the following countries: Austria, Belarus, Belgium, Bulgaria, Croatia, Czech Republic, Cyprus, Denmark, Estonia, Finland, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Portugal, Poland, Spain, Romania, Slovak Republic, Slovenia, Sweden, Turkey, Ukraine, and United Kingdom.

Figure 10: Investment in FinTech companies are larger in countries with lower competition in the banking sector



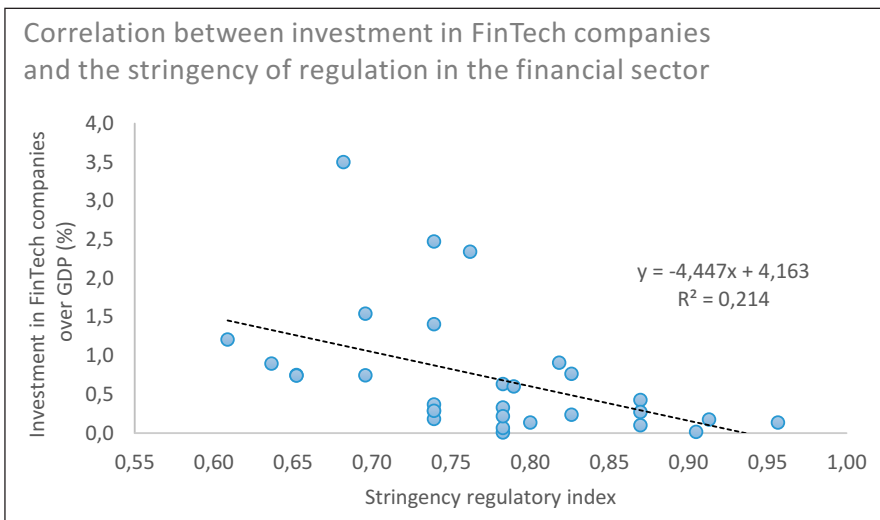
Source: Own elaboration on data from CBInsights (available at: <https://www.cbinsights.com/>) and the World Bank's Global Financial Development Database (available at: <https://datacatalog.worldbank.org/>). Funding FinTech over GDP (%) is the share of outstanding amounts of investment in venture capital, corporate venture capital, private equity, angel investment and other investment over GDP. The Lerner index is defined as the difference between output prices and marginal costs, relative to output prices and ranges from 0 (perfect competition) to 1 (monopolistic competition). The H-Statistics measures the elasticity of bank revenues relative to input prices. H-Statistics ranges from 0 to 1 in monopolistic competition and is above 1 in oligopolistic competition. Bank concentration (%) refers to assets of three largest banks as a share of total commercial banking assets. The sample includes the following countries: Austria, Belarus, Belgium, Bulgaria, Croatia, Czech Republic, Cyprus, Denmark, Estonia, Finland, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Malta, Netherlands, Portugal, Poland, Spain, Romania, Slovak Republic, Slovenia, Sweden, Turkey, Ukraine, and United Kingdom.

Figure 11: Investment in FinTech companies are larger in countries with higher lending interest rates and lower deposit interest rates.



Source: Own elaboration on data from CBInsights (available at: <https://www.cbinsights.com/>) and the World Bank's World Development Indicators Database (available at: <https://datacatalog.worldbank.org/>). Funding FinTech over GDP (%) is the share of outstanding amounts of investment in venture capital, corporate venture capital, private equity, angel investment and other investment over GDP. Bank lending interest rates (%) refers to the rate that usually meets the short- and medium-term financing needs of the private sector. Bank deposits interest rates (%) is the rate paid by commercial or similar banks for demand, time or savings deposits.

Figure 12: Investment in FinTech companies and stringent regulation are complementary.



Source: Own elaboration on data from CBInsights (available at: <https://www.cbinsights.com/>) and the World Bank's Bank Regulation and Supervision Survey (available at: <https://datacatalog.worldbank.org/>). Funding FinTech over GDP (%) is the share of outstanding amounts of investment in venture capital, corporate venture capital, private equity, angel investment and other investment over GDP. The stringency regulatory index is constructed using the following 18 indicators from the World Bank's Bank Regulation and Supervision Survey to measure the sensitivity of the regulatory system to bank risk-taking:

1. Does the minimum capital entry requirement vary depending on the nature of the banking businesses that are licensed?
2. Are the sources of funds to be used as capital verified by the regulatory/supervisory authorities?
3. Which risks are covered by the current regulatory minimum capital requirements in your jurisdiction?
4. Does your agency have the legal authority to require additional capital that is over-and-above the minimum required capital for individual banks if deemed necessary?
5. Which of the following are legally allowed in regulatory capital and which are the minimum (or maximum) percentages?
6. Which of the following are legally allowed in regulatory capital and which are the minimum (or maximum) percentages?
7. Is there a regulatory limit on related party exposures?
8. Can the deposit insurance agency/fund take legal action for violations against laws, regulations, and bylaws (of the deposit insurance agency) against bank directors or other bank officials?
9. Do you have an asset classification system under which banks have to report the quality of their loans and advances using a common regulatory scale?
10. Are there minimum levels of specific provisions for loans and advances that are set by the regulator?
11. Are banks required to submit their financial statements to the banking supervisor prior to public disclosure?
12. Please indicate whether the following enforcement powers are available to the supervisory agency
13. Does the supervisory agency operate an early intervention framework (e.g. prompt corrective action) that forces automatic action when certain regulatory triggers/thresholds are breached?
14. Are there any banks that are not under the jurisdiction of this agency? (No =1; Yes=0)
15. Can the supervisory authority force a bank to change its internal organizational structure?
16. Is the intensity and frequency of supervisory activities explicitly linked to the bank's risk rating?
17. Is your agency responsible for publishing a financial stability report?
18. Do you conduct stress test as part of the process of assessing systemic stability?

Total values are normalized so that the stringency regulatory index ranges from 0 (low stringency) to 1 (high stringency). The sample includes the following countries: Austria, Belarus, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, and United Kingdom.

Institutions

by José Manuel Mansilla-Fernández

The regulatory framework for FinTech in the European Union

The global 2008-2009 financial crisis has defined the framework for financial services and information technology that we know today, and had the catalysis effect on FinTech. The post-crisis financing gap, distrust of formal financial institutions, and regulatory reforms such as the Dodd Frank Act and Basel III have increased financial institutions' compliance obligations and introduced viability stress tests (Gomber et al., 2017; Philippon, 2016). Consequently, the FinTech sector have had the opportunity of providing innovative and cheaper services (González-Páramo, 2017).

At the time of writing this article, not the whole European Union (EU hereafter) legislation covers all aspects of services provided by FinTechs due to the broad spectrum that they supply, e.g. lending, financial advice, insurance, payments, or virtual currencies. Different regulations are applicable depending on the activity carried out, for instance Directive 2000/31/EC is applied for e-commerce, Directive 2002/65/EC for distance marketing of consumer finance services, Directive 2009/110/EC for electronic money, amongst others (EP, 2017).⁹ The European Central Bank (ECB, 2017) will require FinTech banks to apply for the licencing of any bank within the Single Supervisory Mechanism. This measure is aimed at ensuring that FinTech

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

banks are properly authorised and controlling risks. Moreover, the ECB and the national competent authorities will assess whether the new start-ups have enough capital to cover start-ups losses in the first three years of activity, and where applicable, the costs associated to an exit plan.

The **European Commission** (EC, 2017c) launched a **public consultation** on June 2017 to seek input from stakeholders to develop the Commission's policy on FinTech. Public authorities show mixed views on the need to introduce new licensing regimes for Fintech activities. The EC (2017a)'s **Consumer Financial Action Plan** includes a number of actions to support financial innovations in financial retail services, whilst the European Parliament, EP's (2017b), **Report on Fintech** calls on the EC to draw up a **FinTech Action Plan** and deploy cross-sectoral in its work of FinTech (EBA, 2017a).

As a basis of enabling **crowdfunding** to become a regular activity, seven EU Member States have introduced bespoke regulatory frameworks for crowdfunding activities, with requirements for borrowers, lenders, investors and platforms (Ferrarini and Macchiavelo, 2017; EC, 2017b).¹⁰ Tailored regulations may encourage the creation of crowdfunding companies, which would be unable to develop under securities regulation applied to large firms. These regulations would also reduce transaction cost associated to information disclosure (Cumming and Schwienbacher, 2016; He et al., 2017; Hornuf and Schwienbacher, 2015).¹¹

Business models such as **peer-to-peer (P2P) platforms**, **business-to-business (B2B)** and **business-to-consumers (B2C)** require the application of the national rules and implementing the EU consumer protection directives notably the Unfair Commercial Practices Directive (Directive 2005/29/EC) and the Unfair Contract Terms Directive (Council Directive 93/13/EEC). **Information technology (IT hereafter)** and **data regulation** might be an obstacle to information sharing across jurisdictions leading to inefficient 'silos' of information amongst groups.¹²

10. France, Spain, Portugal and the UK have adopted special regimes for lending based-crowdfunding, whilst Germany, Austria, and the Netherlands issued *ad hoc* provisions for some lending based- and investment based-crowdfunding products (Ferrarini and Macchiavelo, 2017).

11. The literature offers an ambivalent effect of regulation on innovation. Blind (2012) shows that incorrect design of regulations may create compliance costs with deter innovation.

12. Tight regulatory deadlines for IT updates amplify this problem by requiring financial institutions to tinker around the edge of the existing infrastructure, or complicating the application of such innovations like requiring in-person identification instead of allowing for digital identification methods.

The Financial Stability Board (FSB) and the national regulatory authorities are expected to remove regulatory barriers and to progress in data harmonization (BIS, 2017; Silverberg et al., 2016). The rules of the Data Protection Directive (Directive 95/46/EC) applies to platforms and issuers/borrowers where personal data are processed. Afterwards, the General Data Protection Directive (Regulation (EU) 2016/679) - which entered into force on the 26th May 2016 but it will apply from the 25th May 2018 - will modernise the data protection rules by providing tools, such as data protection by design, to assist data controllers to comply with the data protection rules. The European Crowdfunding Network has also published its Code of Conduct for observation and application by the European industry at large (EC, 2016).¹³ Importantly, the FSB developed a framework that defines the scope of FinTech activities to identify potential risks and enhance **financial stability**. Increasing cooperation amongst jurisdictions will diminish the risk of fragmentation and or divergence amongst new regulatory frameworks. The FSB identifies mitigating operational risk from third-party service providers, increasing cyber-security measures, and monitoring macrofinancial risks as the three mayor priority areas for international cooperation. Importantly, **regulatory technologies (RegTech)**, which is defined as an application of FinTech for regulatory purposes, may help banks to reduce compliance costs and make internal risk management more efficient, and pursue regulatory objectives such as consumer protection, or anti-money laundering, amongst others (FSB, 2017).

Importantly, the **MiFID** (Directive 2004/39/EC) offers, in principle, the natural regulatory framework for investment based-crowdfunding, as shown by the ESMA's (2014) consultation paper. The regulation of lending based-crowdfunding falls below the banking regulation, but these platforms also offer their products in secondary markets. The **MiFiD-II** (Directive 2014/65/EU) and **MiFIR** (Regulation (EU) No 600/2014) will set up the regulatory framework for investment firms from 3rd January 2018 onwards. Capital adequacy requirements should be proportional to the risk undertaken by the platform. Additionally, MiFID-II also enhances investors' protection of crowd-investors by setting conditions to Member States to adopt exemptions

13. The European Crowdfunding Network is a based-Brussels professional network promoting regulation and transparency. The Code of Conduct is available at: <http://eurocrowd.org/about-us/code-of-conduct-2/>

from the Directive in cases of services like reception of deposits or transmission or orders. In this regard, Ferrarini and Macchiavelo (2017) suggest that MiFID should consider other than transferable securities, when they are offered to retail investors on a marketplace-investing platform.

Regarding **payment services**, the Payment Service Directive (PSD hereafter) (Directive 2007/64/EC) introduced more competition in the European market, and the Single European Payment Area (SEPA) which harmonized card and bank-to-bank payments, but electronic payments remained fragmented. The PSD2 (Directive (EU) 2015/2366) expands the definition of payment services, and the diversity of suppliers. The deadline to introduce the PSD2 into national regulation is 13th January 2018. Additionally, the European Banking Authority's Guideline (2017) sets out the criteria and methodology to be used by payment services to consider an incident as major and, therefore be notified to the competent authority in the Member State. Finally, they detail the minimum information that the national authorities should share.¹⁴

As for **virtual currencies**, e.g. blockchains and cryptocurrencies, there is not a specific regulation at the EU level. However, the European Commission (EC hereafter) suggested a proposal (COM/2016/0450 final - 2016/0208 (COD)) for anti-money laundering directive, and regulation of virtual currencies in July 2017. The European Parliament released in May 2016 a resolution on virtual currencies with a more precise scope (EP, 2016).

In February 2015, the EC adopted the Green Paper (2015a) on building the **Capital Market Union** (CMU hereafter) which sought stakeholders' view on the barriers to develop appropriately regulated crowdfunding or peer-to-peer platforms. Respondents to the CMU Green Paper consultation called for (i) intervention at the EU legislative level mostly referred to ensure investors' protection; (ii) facilitate cross border transactions, and (iii) other respondents answered that a market-led approach would be preferable. Considering this feedback, the CMU Action Plan commits the Commission Services to take stock of the European crowdfunding markets and its regulatory landscape (EC, 2015c, 2017).

The UK Financial Conduct Authority (FCA hereafter)'s Project Unit defines a **regulatory sandbox** as a safe space in which businesses can test new products,

14. See also EC's Green Paper (2015b) on retail financial services.

services, or business models delivering mechanisms without incurring in the whole normal regulatory responsibilities on carrying out the activity in question (Treleven, 2015).¹⁵ The principles behind the UK FCA's regulatory sandboxes can be unbundled and enhanced by introducing 'Minimum Regulatory Obligations', while 'Recovery and Resolution Plans' should resolve possible deficiencies of the start-ups, moving the sandbox from a pilot project to system-wide framework able to nurture innovation in financial markets, and providing a basis for an appropriate way forward to regulate new entrants, i.e. without distorting competition (Arner et al., 2017).¹⁶ Furthermore, the Bank of England's **FinTech Accelerator** works along with firms on how FinTech innovations could be used in central banking to improve financial stability.¹⁷

The aim of these initiatives is to help companies navigate the supervisory regulations applicable to fully operational fintech financial services. On the one hand, **innovations hubs** can be described as an information exchange regime between companies and the supervisor. Supervisors may use innovation hubs to understand and monitor FinTech companies in order to identify risks and opportunities and thus shape new regulations if necessary. On the other hand, **accelerators** are usually funded and run by the private sector. They can be understood as projects or programmes by supervisors or central banks, where private sector firms are involved to address specific problems or to explore new technologies. We may find some examples in Europe. In the **Dutch regulatory sandbox**, the supervisor monitors the application and might impose additional requirements. The responsible for supervision will assess whether the sandbox requires any changes to established policies, rules or regulations. Moreover, supervisors may urge a change in the rules at national or European level. Moreover, the **Bank of Italy's 'FinTech Channel'** initiative is devoted to activate start-ups that offer services to banks and financial intermediaries (FSB, 2017).

15. The other jurisdictions which developed other regulatory sandboxes are Australia, Singapore, Switzerland, Hong Kong, Thailand, Abu Dhabi, and Malaysia (BIS, 2017).

16. Regulation and regulators should take into consideration the implications of Recovery and Resolutions Plans. Market entry for new participants could be facilitated for those that have a clear exit strategy in case of failure (Arner et al., 2017).

17. The other jurisdictions which developed other accelerators are Australia, France, and Singapore (BIS, 2017).

The regulatory framework for FinTech in China and the United States

In **China**, the People's Bank of China and nine other ministers jointly issued the Guiding Opinions, in July 2013, which requires that supervision and regulation of FinTech credit should follow the principles of "legitimate supervision, appropriate supervision, classified supervision, collaborative supervision, and innovative supervision". In addition, the China Banking Regulatory Commission and three other ministers jointly issued the Provisional Rules which forbids certain activities to FinTech credit platforms such as fund-raising for themselves, accepting and collecting lenders' funds, carrying out securitization or assignment of debt, amongst others (BIS and FSB, 2017).

In the **United States**, the legislation does not envisage a single licence or a regulatory agency. FinTech activities fits within the existing financial regulation conducted by several agencies at the state or federal level. The US supervisors are establishing **innovation hubs**, such as Consumer Financial Protection Bureau's Project Catalyst, the Office of the Comptroller of the Currency's Office of Innovation, and the Commodity Futures Trading Commission LabCFTC program, through which FinTeh firms can communicate their concerns to the above-mentioned agencies.¹⁸ Additionally, The US have begun to address chartering and licencing consideration on the FinTech space, for instance the New York State's 'Bitlicense' program or the Office of the Comptroller of the Currency in Texas. Importantly, the Vision 2010 initiative is aimed at addressing some cross-jurisdictional issues related to the 'passporting' efforts under consideration in the EU. Finally, the Financial Consumer Protection Bureau sought information from the industry and the public about the use or potential use of data and modelling techniques in credit scoring (Tsai, 2017).

18. Other jurisdictions which set up innovation hubs are Australia, Belgium, the ECB, France, Germany, Italy, Hong Kong, Japan, Korea, Luxembourg, the Netherlands, Singapore, Switzerland, and the UK (BIS, 2017).

References

- Arner, D.W., Barberis, J., and Buckley, R.O. (2017). FinTech and RegTech in a nutshell, and the future in sandbox. CFA Institute. Research Foundations Briefs, 3, 1-20.
- Bank for International Settlements (BIS) and Financial Stability Board (FSB). (2017). FinTech credit. Market structure, business models and financial stability implications. 22 May 2017. Available at: https://www.bis.org/publ/cgfs_fsb1.htm
- Bank for International Settlements (BIS) (2017). Sound practices: Implications for Fintech developments for banks supervisors. Consultative document. Available at: <https://www.bis.org/bcbis/publ/d415.pdf>
- Blind, K. (2012). The influence of regulations on innovation: A quantitative assessment for OECD countries. *Research Policy*, 41, 391–400.
- Buckley, R.P., and Malady, L. (2015). Building consumer demand for digital financial services – the new regulatory frontier. *Journal of Financial Perspectives*, 122-137.
- Cumming, D.J., and Schwienbacher, A. (2016). Fintech Venture Capital. SSRN Working Papers. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2784797
- European Banking Authority (EBA) (2017a). Discussion Paper on the EBA's approach to financial technology (FinTech). Available at: <https://www.eba.europa.eu/documents/10180/1919160/EBA+Discussion+Paper+on+Fintech+%28EBA-DP-2017-02%29.pdf>
- European Banking Authority (EBA) (2017b). Guidelines on major incident reporting under Directive (EU) 2015/2366 (PSD2). Available at: <http://www.eba.europa.eu/documents/10180/1914076/Guidelines+on+incident+reporting+under+PSD2+%28EBA-GL-2017-10%29.pdf>
- European Central Bank (ECB) (2017). Guide to assessment of fintech credit institutions license applications. September 2017. Available at: https://www.bankingsupervision.europa.eu/legalframework/publiccons/pdf/licensing_and_fintech/ssm.guide_on_assessment_for_licensing_of_fintech_credit_insts_draft.en.pdf
- European Commission (EC) (2015a). GREEN PAPER Building a Capital Market Union. COM (2015) 063 final. Available at: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52015DC0063>
- European Commission (EC) (2015b). GREEN PAPER on retail financial services Better products, more choice, and greater opportunities for consumers and businesses. COM (2015) 630 final. Available at: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2015:630:FIN>
- European Commission (EC) (2015c). Action plan on building a Capital Market Union. Available at: https://ec.europa.eu/info/publications/action-plan-building-capital-markets-union_en
- European Commission (EC) (2016). Crowdfunding in the EU Capital Market Union. Commission Staff Working Document, 3rd May 2016. Available at: https://ec.europa.eu/info/system/files/crowdfunding-report-03052016_en.pdf
- European Commission (EC) (2017a). Consumer Finance Service Action Plan. Available at: https://ec.europa.eu/info/publications/consumer-financial-services-action-plan_en
- European Commission (EC) (2017b). Mid-Term Review of the Capital Markets Union Action Plan. Available at: https://ec.europa.eu/info/sites/info/files/communication-cmu-mid-term-review-june2017_en.pdf
- European Commission (EC) (2017c). Public consultation on FinTech: a more competitive and innovative European financial sector. Available at: https://ec.europa.eu/info/finance-consultations-2017-fintech_en

European Parliament (EP) (2017a). Financial technology (FinTech): Prospects and challenges for the EU. Briefing. Available at: [http://www.europarl.europa.eu/thinktank/en/document.html?reference=EPRS_BRI\(2017\)599348](http://www.europarl.europa.eu/thinktank/en/document.html?reference=EPRS_BRI(2017)599348)

European Parliament (EP) (2017b). Report on FinTech: the influence of technology on the future of the financial sector. Available at: <http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//TEXT+REPORT+A8-2017-0176+0+DOC+XML+V0//EN>

European Securities and Market Authority (ESMA) (2014). Consultation paper on MIFID II /MIFIR. Available at: <https://www.esma.europa.eu/press-news/consultations/consultation-paper-mifid-iimifir>

Financial Stability Board (FSB) (2017). Financial stability implications for FinTech. Supervisory and regulatory issues that merit authorities' attention. Available at: <http://www.fsb.org/wp-content/uploads/R270617.pdf>

Ferrarini, G., and Macchiavello, E. (2017). Fintech and alternative finance in the CMU: The regulation of the marketplace investing. Mimeo.

Gomber, P., Koch, J.-A., and Siering, M. (2017). Digital Finance and FinTech: current research and future research directions. *Journal of Business Economics*, 87, 537-580.

González-Páramo, J.M. (2017). Financial innovation in the digital age: Challenges for regulation and competition. *Revista de Estabilidad Financiera*, 32, 9-37.

He, D., Leckow, R., Haksar, V., Mancini-Griffoli, T., Jenkinson, N., Kashima, M., Khaonarong, T., Rochon, C., and Tourpe, H. (2017). Fintech and financial services: Initial considerations. IMF Staff Discussion Notes No. 17 /05. Available at: <https://www.imf.org/en/Publications/Staff-Discussion-Notes/Issues/2017/06/16/Fintech-and-Financial-Services-Initial-Considerations-44985>

Hornuf, L., and Schwenbacher, A. (2015). Should securities regulation promote crowdinvesting? SSRN Working paper. Available at: <http://ssrn.com/abstract=2412124>.

Philippon, T. (2016). The FinTech opportunity. NBER Working Paper No. 22476. Available at: <http://www.nber.org/papers/w22476>

Silverberg, K., Portilla, A., French, K., van Liebergen, B., and Van Den Berg, S. (2016). RegTech financial services: Technology solutions for compliance and reporting. Institute of International Finance, March 2016. Available at: <https://www.iif.com/publication/research-note/regtech-financial-services-solutions-compliance-and-reporting>

Treleven, P. (2015). Financial regulation of FinTech. *Journal of Financial Perspectives*, 114-121.

Tsai, Gerald. FinTech and the U.S. regulatory response. Remarks at the 4th Bund Summit on Fintech. Shanghai, China. Available at: <http://www.frbsf.org/our-district/files/Tsai-Shanghai-Speech-Fintech-US-Regulatory-Response.pdf>

Legislation cited

Bank for International Settlements (2014). International regulatory framework for banks (Basel III). Available at: <http://www.bis.org/bcbs/basel3.htm>

Council Directive 93/13/EEC of 5 April 1993 on unfair terms in consumer contracts. Available at: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:31993L0013>

Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data. Available at: <http://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX:31995L0046>

Directive 2000/31/EC of the European Parliament and of the Council of 8 June 2000 on certain legal aspects of information society services, in particular electronic commerce, in the Internal Market (Directive on electronic commerce). Available at: <http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32000L0031>

Directive 2002/65/EC of the European Parliament and of the Council of 23 September 2002 concerning the distance marketing of consumer financial services and amending Council Directive 90/619/EEC and Directives 97/7/EC and 98/27/EC. Available at: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32002L0065>

Directive 2004/39/EC of the European Parliament and of the Council of 21 April 2004 on markets in financial instruments amending Council Directives 85/611/EEC and 93/6/EEC and Directive 2000/12/EC of the European Parliament and of the Council and repealing Council Directive 93/22/EEC. Available at: <http://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX:32004L0039>

Directive 2005/29/EC of the European Parliament and of the Council of 11 May 2005 concerning unfair business-to-consumer commercial practices in the internal market and amending Council Directive 84/450/EEC, Directives 97/7/EC, 98/27/EC and 2002/65/EC of the European Parliament and of the Council and Regulation (EC) No 2006/2004 of the European Parliament and of the Council ('Unfair Commercial Practices Directive'). Available at: <http://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX%3A32005L0029>

Directive 2007/64/EC of the European Parliament and of the Council of 13 November 2007 on payment services in the internal market amending Directives 97/7/EC, 2002/65/EC, 2005/60/EC and 2006/48/EC and repealing Directive 97/5/EC (Text with EEA relevance). Available at: <http://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX%3A32007L0064>

Directive 2009/110/EC of the European Parliament and of the Council of 16 September 2009 on the taking up, pursuit and prudential supervision of the business of electronic money institutions amending Directives 2005/60/EC and 2006/48/EC and repealing Directive 2000/46/EC (Text with EEA relevance). Available at: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32009L0110>

Directive 2014/65/EU of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments and amending Directive 2002/92/EC and Directive 2011/61/EU Text with EEA relevance. Available at: <http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=celex:32014L0065>

Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC (Text with EEA relevance). Available at: <https://publications.europa.eu/en/publication-detail/-/publication/dd85ef2e-a953-11e5-b528-01aa75ed71a1/language-en>

Dodd-Frank Wall Street Reform and Consumer Protection of 2010. Senate and House of Representatives of the United States of America in Congress Available at: <https://www.sec.gov/about/laws/wallstreetreform-cpa.pdf>

European Parliament (EP) (2016). Resolution of 26 May 2016 on virtual currencies (2016/2007(INI)). Available at: <http://www.europarl.europa.eu/sides/getDoc.do?type=TA&reference=P8-TA-2016-0228&language=EN&ring=A8-2016-0168>

Guiding Opinions of the People's Bank of China, the Ministry of Industry and Information Technology, the Ministry of Public Security, et al, on Promoting the Sound Development of Internet Finance. Available at: <http://en.pkulaw.cn/display.aspx?cgid=251703&lib=law>

Provisional Rules for the Administration of the Business Activities of Online Lending Information Intermediary Institutions.

Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Directive (EU) 2015/849 on the prevention of the use of the financial system for the purposes of money laundering or terrorist financing and amending Directive 2009/101/EC (COM/2016/0450 final - 2016/0208 (COD)). Available at: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52016PC0450>

Regulation (EU) No 600/2014 of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments and amending Regulation (EU) No 648/2012 Text with EEA relevance. Available at: <http://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX:32014R0600>

Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation). Available at: <http://eur-lex.europa.eu/eli/reg/2016/679/oj>

The Maastricht Treaty (1992). Available at: https://europa.eu/european-union/sites/europaeu/files/docs/body/treaty_on_european_union_en.pdf

The Single European Act (1986). Available at: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=LEGISSUM%3Axy0027>

A Bird Eye (Re)view of Key Readings

by José Manuel Mansilla-Fernández

This section of the journal indicates a few and briefly commented references that a non-expert reader may want to cover to obtain a first informed and broad view of the theme discussed in the current issue. These references are meant to provide an extensive, though not exhaustive, insight into the main issues of the debate. More detailed and specific references are available in each article published in the current issue.

On the determinants of FinTechs and competitive environment

The term **FinTech** (also Fintech or Fin-tech) is a neologism originated from the words ‘Financial’ and ‘Technology’ and describes Internet-based technologies -e.g. cloud computing or mobile Internet- with established business activities of the banking industry -e.g. money lending or transaction banking- (Gomber et al., 2017).¹⁹ Such innovations may disrupt existing structures and blur industry boundaries, facilitate strategic disintermediation, and revolutionize how non-financial firms demand financial services and how financial firms supply credit and products (Philippon, 2016).²⁰ The sector has

19. The digital transformation of the financial sector and the society forces authorities to provide a regulatory framework that includes and promotes new digital value positions, thus benefiting customers and creating efficiency gains in the market. The different transformations of the financial sector can be categorized into those affecting the *infrastructure*, the *banking products*, and the *distribution* or customer relationships (González-Páramo, 2017).

20. The increased international focus on financial inclusion is also contributing to the fast pace of regulatory development for digital financial services (DFS hereafter), since these products may foster

recently attracted the attention of regulators, industry participants, customers, and scholars alike (Arner et al., 2016). Besides, increased regulatory burdens might favour the emergence of **shadow banking** (Buchack et al., 2017). In fact, these banks provide credit to underserved and higher-risk borrowers who, otherwise, would be excluded from the traditional banking sector, although these loans are usually poorly performed. According to Buchack et al., FinTech companies provided around the third part of bank loan origination for shadow banks in 2015. In addition, FinTech lenders are able to make use of **big-data** to better screen borrowers and set interest rates that better predict *ex-post* loan performances (Rajan, 2015). Contrarily, other studies demonstrate that FinTech lenders might offer more expensive credit than non-FinTech lenders (FSB, 2017). However, consumers' willingness to borrow costly FinTech lending, it might also reflect that they are offering other convenient services (Philippon, 2015).

An issue in the regulatory debate is whether and how FinTech will affect **financial stability** (Demertzis et al., 2017, Vives, 2017). For instance, FinTech payment services providers have not currently chosen to undertake traditional banking activities, and at the same time, they have not yet reached the scale to become systemic. Still, regulators should monitor changes in the structure and risk of the financial service industry (Carney, 2017). Regulators and scholars are concerned about the emergence of relatively less sound institutions, and some of them escaping prudential supervision, thus reducing financial stability (Boot, 2016; DNB, 2017).

The concept of **crowdfunding** comes from the concept of crowdsourcing, which involves the 'crowd' to obtain funds, ideas, feedback, and solutions to carry out an entrepreneurial activity (Belleflamme et al., 2014). Kleemann et al (2008) defines **crowdsourcing** when a profit-oriented firm outsources essential tasks for the making or sale their products to the public –the crowd– in form of an open call on the Internet aimed at attracting the attention of their customers to contribute to the firm's production process. From the financial point of view, crowdfunding may be related to bootstrapping finance.

economic growth. Policymakers should look beyond their traditional policy targets of promoting safe and efficient financial systems. Financial inclusion will be strengthened when regulators focus on the design of consumer demand. The financial inclusion-DFS tandem represents a new regulatory frontier for financial regulators to ensure access to financially excluded -or unbanked- and protection to financially included -or banked- (Buckley and Malady, 2015).

This form of financing consists of using external sources of funds such as bank loans, business angels or venture capital, amongst others (see Bhide, 1992; Bofondi, 2017; Cosh et al., 2009; Ebbe and Johnson, 2006). An emerging literature on **reward-based crowdfunding** identifies the factors driving a campaign's success such as project-level quality signals (Mollick, 2014), narrative (Marom and Sade, 2013), the use of social media (Thies et al., 2014; Hong et al., 2015), stretch goals (Li and Jarvenpaa, 2015), project creator social capital (Colombo et al., 2015) and reputation (Li and Martin, 2016). Kuppuswamy and Bayus (2017) extend the literature proposing that investors support crowdfunding projects when they believe that their contribution will be socially relevant.

Recent research is pointing towards **equity crowdfunding** as an alternative form of entrepreneurial finance (Hornuf and Schwienbacher, 2017a). Equity crowdfunding (also referred to as investment-based crowdfunding, securities-based crowdfunding, and crowdfunding) is a subcategory of crowdfunding in which companies issue financial securities to satisfy their capital needs. Empirical research on equity crowdfunding is still embryonic, since this segment is recently approachable to the 'crowd' in some jurisdictions like the United States or lacked specific regulation (Hornuf and Schwienbacher, 2017b). Fundraisers in some jurisdictions offer equity shares in a private limited liability company, for instance in platforms like Crowdcube or Seedrs in the UK, or Bergfürst in Germany (Vismara, 2016). Before the campaign goes online, the start-up and the platform agree on a valuation of the company, and the founders must decide the amount of capital they want to raise. Depending on the valuation and the capital needs, the platform provides a standard contract, so that the 'crowd' could participate in the future cash flows of the company. The 'crowd' generally hold mezzanine financial instruments which ranks between ordinary shares and ordinary liabilities. Some authors have described the size, growth and geographic distribution of markets (Vulkan et al., 2016; Günther et al., 2017). Interestingly, financial literature is growing towards the **dynamic effects** of equity crowdfunding. Information flows amongst individual investors are a determinant factor in equity investment process. Vismara (2017) finds that the evolution of investment in the early stages determinate the probability of success of an equity crowdfunding campaign. The existence of dynamics within campaigns

has been overlooked in previous literature.²¹ Furthermore, Block et al. (2017) demonstrate that start-ups can generate credible information when updating new developments of the projects, e.g. funding events.

Despite the growing importance of crowdfunding markets and their perception as markets of the future, understanding of their functioning is still limited. The central issue of **peer-to-peer (P2P hereafter) financing** is the absence of formal intermediaries. The seminar literature establishes how **incentives** address investors' behaviour to draw implications for financial markets. Theoretical research builds on the concept of **information asymmetry** that may result in agency problems (Holmstrom and Tirole, 1997).

An important challenge for P2P finance is understanding how players screen borrowers when allocating credit. Whether a person defaults on loan is driven by incentives which reflects complexities and idiosyncrasies of human behaviour (Cumming et al., 2015; Dhar and Stein, 2016; Iyer et al., 2015).²² This screening process has traditionally been conducted by the banking industry that creates '**hard information**' such as credit scores, completed by using sophisticated models based on payment history along with verifiable information. Technological advances have allowed P2P platform users to assess creditworthiness of their peers (Li and Martin, 2016).²³ These platforms provide nonstandard – or '**soft information**' – about borrowers. The cornerstone of P2P platforms is that lending decisions are based on collective choices of several individual investors drawing conclusions on their own experience. The downside is that they usually have limited experience in assessing borrowers' creditworthiness due to soft-information is self-reported, thus outperforming the credit scores in terms of predicting default (Iyer et al., 2015).²⁴ Liberti and Petersen (2017) reconsider the concept of hard- and soft-information in banking

21. The firsts days of a campaign are found to be very different from the rest. Agrawal et al. (2015) demonstrate that friends and family, whom may invest for different reasons, support part of the investment in the first days of the campaign. Besides, Hornuf and Schwienbacher (2017a) also find that peer investment effects are stronger after the first seven days.

22. See Cumming et al. (2015) for a broad literature review.

23. Lin et al. (2013) demonstrate that entrepreneurial social capital plays an essential role in setting P2P lending market and venture capital. In this line, Burtch et al. (2013) and Lin and Viswanathan (2016) suggest that cultural differences and geographic distance are two determinants in on-line P2P lending. Accordingly, Agrawal et al. (2011) find that on-line platforms seems to eliminate distance-related economic frictions, but not social frictions such as family or friends.

24. This literature builds on theoretical papers that focus on information aggregation through prices (Grossman, 1976; Townsend, 1978; Vives 1993, 1995), and learning on decentralized markets (Duffie and Manso, 2007; Duffie et al. 2009; Wolinsky, 1990).

markets. They consider that hard-information is quantitative and its content is independent of the collection process. Technology has changed the collection process and the way in which information is communicated. This has changed the functioning of financial markets and institutions in favour of soft-information which is mostly qualitative, personally transmitted, and accumulated over time. This change in lending technologies altered the design of financial institutions moving decisions outside the traditional boundaries of the organization. Furthermore, Hildebrand et al. (2017) demonstrate that, in presence of rewards, group leader's bids enhance the **credibility of the projects** and the perception of high quality, afterwards *ex-post* default rates suggest the presence of perverse incentives that make leader behave strategically. Accordingly, Agrawal et al. (2017) demonstrate that syndicates align incentives of equity issuers and follow-on investors, enhancing investors' reputation and performance, which can be used to attract new capital from a global community of investors.

The rising of the 'new economy' based on shared economy and huge amounts of information processing, also called 'big data', opens the debate amongst scholars on the implications for **competition** (Carbó-Valverde, 2017). According to Rifkin (2014), the classical industrial organization theory establishes that lower prices resulting from improvements in technology and productivity will increase competition amongst sellers. Nevertheless, in the long run new players continue to introduce new technology which increases productivity and reduce prices for the similar goods or services. Finally, the monopoly is broken, resulting in intense competition which forces the introduction of ever-leaner technology, and leading each additional unit produced to 'near-zero marginal' costs.²⁵

On future challenges for FinTechs

The main challenge seems to be to create a unique environment for banks and non-bank providers under an adequate **regulation** and **supervision**. The introduction of digital technology allows for direct matching between

25. See Carbó-Valverde (2017) for further discussion.

borrowers and investors. However, as discussed above, financing is more than this. Given the complexity of financial services, the control of risk after lending or investment have taken place, the trading of claims if investors need to access liquidity, the management of non-performing loans, and systemic importance of start-ups are aspect to be considered for scholars and regulatory authorities (Dermine, 2016).

Digitalization and FinTech represents an opportunity to reduce marginal costs and gain productivity. They may imply a large **accumulation of intangible assets** which would be difficult to value in capital markets, thus blurring industry boundaries, and creating significant privacy, regulatory and law enforcements (Carbó-Valverde, 2017). Furthermore, the Internet generates a single marketplace -where individuals can engage numerous economic activities- which might raise serious questions of federalism and international coordination (Brummer and Gorfine, 2014).

The lighter regulation of FinTech will have important implications for competition between banks and new entrants such as payment systems and crowdfunding platforms. FinTech are encroaching on the traditional business of banks, despite banks are adapting to the new environment. However, new competitors are able to use 'hard-information' to erode the traditional bank-customer relationship based on 'soft-information'. FinTech competitors stay clear from asking a banking licence and try to skim profitable business from banks. Furthermore, whilst banks have been traditionally focused on business, FinTech are more focused on customers (Vives, 2016).²⁶ An important question is to what extent existing banks can be at the forefront of new developments, for instance absorbing FinTech players and their innovations (Boot, 2016).

In the EU context, the fundamental question is whether FinTech can disrupt Europe's financial system in a way that promotes the **Capital Market Union**, helps integrate financial system borders and increases financial stability and efficiency. Moreover, a further question is whether the disruption will follow at the European Union level or at the national level (Demertzis et al., 2017; Ferrarini and Macchiavello, 2017).

26. The core business of banks is maturity transformation by collecting short-term deposits and lending long-term. Capital markets, in turn, consists of stocks and bond markets, derivatives, and settlements and payment services. New FinTech business models have the potential disrupt banks offering similar services and act as marketplace organizers. The FinTech transformation could fundamentally change the whole financial intermediation chain (Demertzis et al., 2017).

References

- Agrawal, A.K., Catalini, C., and Goldfarb, A. (2011). The geography of crowdfunding. NBER Working Paper No. 16820. Available at: <http://www.nber.org/papers/w16820>
- Agrawal, A., Catalini, C., and Goldfarb, A. (2015). Crowdfunding: Geography, Social Networks, and the Timing of Investment Decisions. *Journal of Economics and Management Strategy*, 24, 253-274.
- Agrawal, A., Catalini, C., and Goldfarb, A. (2016). Are syndicates the killer app of equity crowdfunding? *California Management Review*, 58 / 2, 111-124.
- Arner, D.W., Barberis, J., and Buckley, R.P. (2016). The evolution of Fintech: A new post-crisis paradigm. *Georgetown Journal of International Law*, 47, 1271-1320.
- Belleflamme, P., Lambert, T., and Schwienbacher, A. (2014) Crowdfunding: tapping the right crowd. *Journal of Business Venturing*, 29, 585-609.
- Bhide, A. (1992). Bootstrap Finance: The Art of Start-Ups. *Harvard Business Review*, 70 (November-December), 109-117.
- Block, J., Hornuf, L., and Moritz, A. (2017). Which Updates During an Equity Crowdfunding Campaign Increase Crowd Participation? *Small Business Economics*, forthcoming.
- Bofondi, M. (2017). Il lending-based crowdfunding: opportunità e rischi. Bank of Italy Occasional Papers No. 375. Available at: <http://www.bancaditalia.it/pubblicazioni/qef/2017-0375/index.html>
- Boot, A. (2016). Understanding the Future of Banking Scale & Scope Economies, and FinTech. University of Amsterdam, mimeo. Available at: file:///C:/Users/Jose%20M/Downloads/understanding_the_future_of_banking_scale_scope_economies_and_fintech_27_january_2016.pdf
- Buckley, R.P., and Malady, L. (2015). Building consumer demand for digital financial services – The new regulatory frontier. *Journal of Financial Perspectives: FinTech*, 3, 112-137.
- Brummer, C., and Gorfine, D. (2014). FinTech. Building a 21st-century regulator toolkit. Center for Financial Markets. Available at: <http://assets1c.milkeninstitute.org/assets/Publication/Viewpoint/PDF/3.14-FinTech-Reg-Toolkit-NEW.pdf>
- Burtch, G., Ghose, A., and Wattal, S. (2013). Cultural differences and geography as determinants of online Pro-social lending. Fox School of Business Research Paper No. 14-021. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2271298
- Buchak, G., Matvos, G., Pikorski, T., and Seru, A. (2017). Fintech, Regulatory Arbitrage, and the Rise of Shadow Banking', NBER Working Paper, No. 25288. Available at: <https://www.gsb.stanford.edu/faculty-research/working-papers/fintech-regulatory-arbitrage-rise-shadow-banks>
- Carbó-Valverde, S. (2017). The impact on digitalization on banking and financial stability. *Journal of Financial Markets and Institutions*, 5, 133-140.
- Carney, M. (2017). The Promise of Fintech – Something New Under the Sun, Speech at Deutsche Bundesbank G20 conference, by Bank of England governor Mark Carney, January 25th. Available at: <http://www.fsb.org/wp-content/uploads/The-Promise-of-FinTech-%E2%80%93-Something-New-Under-the-Sun.pdf>
- Colombo, M., Franzoni, C., and Rossi-Lamastra, C. (2015). Internal social capital and the attraction of early contributions in crowdfunding projects. *Entrepreneurship Theory and Practice*, 39, 75-100.

- Cosh, A., Cumming, D., and Hughes, A. (2009). Outside Entrepreneurial Capital. *Economic Journal*, 119, 1494-1533.
- Cumming, D., Dannhauser, R., and Johan, S. (2015). Financial market misconduct and agency conflicts: A synthesis and future directions. *Journal of Corporate Finance*, 34, 150-168.
- Demertzis, M., Merler, S., and Wolff, G.B. (2017). Capital Market Union and the fintech opportunity. Bruegel Policy Contribution Issue no. 22. September 2017. Available at: <http://bruegel.org/2017/09/capital-markets-union-and-the-fintech-opportunity/>
- Dermine J. (2016). Digital Banking and Market Disruption: A Sense of Déjà Vu? *Financial Stability Review*, Banque de France, April, 17-24.
- Dhar, V., and Stein, R.S. (2016). FinTech platforms and strategy. MIT Sloan School Working Paper 5183-16. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2892098
- DNB (2017), Innovation in the loan market: Prudential concerns for the financial sector and supervision. Policy paper, De Nederlandsche Bank (Dutch Central Bank), November.
- Duffie, D., Malamud, S., and Manso, G., (2009) Information Percolation with Equilibrium Search Dynamics. *Econometrica*, 77, 1513-1574.
- Duffie, D., and Manso, G. (2007). Information Percolation in Large Markets. *American Economic Review Papers and Proceedings*, 97, 203-209.
- Ebben, J., and Johnson, A. (2006). Bootstrapping in small firms: An empirical analysis of change over time. *Journal of Business Venturing*, 21, 851-865.
- Ferrarini, G., and Macchiavello, E. (2017). Fintech and alternative finance in the CMU: The regulation of market place investment. Mimeo.
- Financial Stability Board (FSB) (2017). Financial stability implications for FinTech. Supervisory and regulatory issues that merit authorities' attention. Available at: <http://www.fsb.org/wp-content/uploads/R270617.pdf>
- Gomber, P., Koch, J.-A., and Siering, M. (2017). Digital Finance and FinTech: current research and future research directions. *Journal of Business Economics*, 87, 537-580.
- González-Páramo, J.M. (2017). Financial innovation in the digital age: Challenges for regulation and competition. *Revista de Estabilidad Financiera*, 32, 9-37.
- Grossman, S. (1976). On the efficiency of competitive stock markets where traders have diverse information. *Journal of Finance*, 31, 573-585.
- Günther, C., Johan, S., and Schweizer, D. (2017). Is the Crowd Sensitive to Distance? - How Investment Decisions Differ by Investor Type. *Small Business Economics*, forthcoming.
- Hildebrand, T, Puri, M., and Rocholl, J. (2017). Adverse incentives of crowdfunding. *Management Science*, 63, 587-608.
- Holmstrom, B., and Tirole, J. (1997). Financial intermediation, loanable funds, and the real sector. *Quarterly Journal of Economics*, 112, 663-691.
- Hong, Y., Hu, Y., and Burtch, G. (2015). How does social media affect contribution to public versus private goods in crowdfunding campaigns? Thirty Sixth International Conference on Information Systems (Fort Worth). http://www.fox.temple.edu/conferences/cist/papers/Session%207A/CIST_2015_7A_4.pdf
- Hornuf, L., and Schwiabacher, A. (2017a). Market mechanisms and funding dynamics in equity crowdfunding. *Journal of Corporate Finance*, forthcoming.
- Hornuf, L., and Schwiabacher, A. (2017b). Which Securities Regulation Promotes Equity Crowdfunding? *Small Business Economics*, forthcoming.

- Iyer, R., Khwaja, A.I., Luttmer, E.F., and Shue, K. (2015). Screening peers softly: Inferring the quality of small borrowers. *Management Science*, 62, 1554-1577.
- Kleemann, F., Voß, G.G., and Rieder, K. (2008). Un(der)paid innovators: the commercial utilization of consumer work through crowdsourcing. *Science, Technology, and Innovation Studies*, 4, 5-26. Available at: <http://www.sti-studies.de/ojs/index.php/sti/article/view/81>
- Kuppuswamy, V., and Bayus, B.L. (2017). Does my contribution to your crowdfunding project matter? *Journal of Business Venturing*, 32, 72-89.
- Li, E., and Martin, J.S. (2016). Capital formation and financial intermediation: The role of entrepreneur reputation formation. *Journal of Corporate Finance*, forthcoming.
- Li, Z., and Jarvenpaa, S. (2015). Motivating IT-mediated crowds: the effect of goal setting on project performance in online crowdfunding. Available at: <http://ssrn.com/abstract=2672056>
- Liberti, J.M., and Petersen, M.A. (2017). Information: Hard and Soft. Mimeo. Available at: <http://www.kellogg.northwestern.edu/faculty/petersen/htm/papers/hard%20and%20soft%20information.pdf>
- Lin, M., Prabhala, N.R., and Viswanathan, S. (2013). Judging borrowers by the company they keep: Friendship networks and information asymmetry in online peer-to-peer lending. *Management Science*, 59, 17-35.
- Lin, M., and Viswanathan, S. (2016). Home Bias in Online Investments: An Empirical Study of an Online Crowd Funding Market. *Management Sciences*, 62, 1393-1414.
- Marom, D., and Sade, O. (2013). Are the life and death of an early stage venture indeed in the power of the tongue? Lessons from online crowdfunding pitches. Available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2255707
- Mollick, E. (2014). The dynamics of crowdfunding: an exploratory study. *Journal of Business Venturing*, 29, 1-16.
- Philippon, T. (2015). Has the US finance industry become less efficient? On the theory and measurement of financial intermediation. *American Economic Review*, 105, 1408-1438.
- Philippon, T. (2016). The FinTech opportunity. NBER Working Paper No. 22476. Available at: <http://www.nber.org/papers/w22476>
- Rajan, U., Seru, A., and Vig, V. (2015). The failure of models that predict failure: Distance, incentives, and defaults. *Journal of Financial Economics*, 115, 257-260.
- Rifkin J. (2014). *The Zero Marginal Cost Society: The Internet of Things, the Collaborative Commons, and the Eclipse of Capitalism*. New York: Palgrave Macmillan.
- Thies, F., Wessel, and M., Benlian, A. (2014). Understanding the dynamic interplay of social buzz and contribution behavior within and between online platforms-evidence from crowdfunding. Thirty Fifth International Conference on Information Systems (Auckland). <https://pdfs.semanticscholar.org/ef94/73055dd96e5d146c88ae3cc88d06e7adfd07.pdf>
- Townsend, R.M. (1978). Market anticipations, rational expectations, and Bayesian analysis. *International Economic Review*, 19, 481-494.
- Vismara, S. (2016). Equity Retention and Social Network Theory in Equity Crowdfunding. *Small Business Economics*, 46, 579-590.
- Vismara, S. (2017). Information Cascades Among Investors in Equity Crowdfunding. *Entrepreneurship Theory and Practice*, forthcoming.
- Vives, X. (1993). How fast do rational agents learn? *Review of Economic Studies*, 60, 329-347.

Vives, X. (1995). The speed of information revelation in a financial market mechanism. *Journal of Economic Theory*, 67, 178-204.

Vives, X. (2017). The Impact of Fintech on Banking. *European Economy – Banks, Regulation, and the Real Sector*, this issue.

Vives, X. (2016). Competition and stability in banking. The role of regulation and competition policy. Princeton University Press, New Jersey, United States of America.

Vulkan, N., Astebro, T., and Fernandez-Sierra, M. (2016). Equity crowdfunding: A new phenomena. *Journal of Business Venturing Insights*, 5, 37-49.

Wolinsky, A. (1990). Information Revelation in a Market with Pairwise Meetings. *Econometrica*, 58, 1-23.

Articles

Digital Disruption and Bank Lending

by Jean Dermine^{27 28}

Abstract

The paper assesses the threat posed by digital banking as seen in the context of a long series of financial and technological innovations in the banking sector. It focuses on the economics of banking services and banks' two main functions – as providers of liquidity and loans – and analyzes whether these could be displaced by peer-to-peer and marketplace lending.

Digital Banking and Market Disruption

Over the past three years, analysts of the banking industry have met a new terminology: P2P, crypto-currencies, blockchain decentralized ledger technology, robo-advisors, chatbots, big data, millennials, sandbox, API... Fintech – the application of digital technology to finance – is disrupting banking markets. New payments systems have proliferated such as PayPal, Venmo, M-Pesa, ApplePay, and Alipay. TransferWise and WorldRemit are competing with the incumbent Western Union and MoneyGram for international transfers and remittances. On the credit side, Lending Club, Prosper and SoFi in the US, the British Zopa and Funding Circle, the French Prêt d'Union or Alibaba in China are competing with established banks in the

27. Professor of Banking and Finance. INSEAD, Singapore.

28. Invited contribution to *European Economy*. The paper extends an earlier analysis (Dermine, 2016).

unsecured consumer loan and small and medium size enterprises (SME) markets as well as in the residential lending market. London-based Prodigy Finance platform offers loans to international postgraduate students attending top universities. The scale of the threat to the banking industry is summed up in the following:

“The aim is to inflict death by a thousand cuts. Fintech start-ups are nimble piranhas, each focusing on a small part of a bank’s business model to attack” (Financial Times, 14 October 2015).

The cataclysmic predictions of the slow death of banking reminds me of similar gloomy forecasts made over the past 35 years. When telephone banking was introduced in the 1980s, there were fears that telephone companies would enter the banking industry and displace the incumbent players. But that did not happen – the banks themselves started to offer telephone based services.

When in the 1990s, capital markets – bonds and equity markets – were deregulated, it was predicted that direct finance would replace costly and inefficient indirect finance and financial intermediation. But the prediction turned out to be wrong: banking assets-to- GDP ratios grew in both developed and emerging economies.

At the turn of the millennium, as the internet bubble went up, bankers were terrified that Microsoft would enter their industry and enable customers to navigate online from one bank to another – such transparency of prices and product offers seemed set to undermine revenues. As of October 2017, this company does not offer banking services.

After 35 years of impending doom, it seems appropriate to ask whether digital banking will bring market disruption, or is it simply a fad?

The objective of this paper is to analyze the sources of market disruption brought by digital technology with a specific focus on lending. It is divided into five sections. In the first section I review six fundamental services offered by banks. In the second, I attempt to identify the major changes in technology, and in the third how they may disrupt the offering of banking services. The case of a highly visible digital lender, Lending Club, is analyzed in Section Four. In the final section, I argue that shadow banking enlarges the menu of credit-related assets offered to investors who will choose according to their appetite for credit and/or liquidity risk.

Section 1. Economics of Banking Services: Six Main Functions

In financial markets, economic units holding surplus funds, be they households or firms (or more rarely, governments) can finance directly economic units that are short of funds, such as other firms, households, or governments. Savers can buy bonds or shares issued by deficit units directly on the financial markets. This is referred to as *direct finance*. Where there is an intermediary between the units with surplus and those with a deficit, we refer to *indirect finance*. A bank is one example of a financial intermediary, collecting deposits and granting loans. Others include insurance companies, pension funds, and investment funds, such as mutual funds or hedge funds. Shadow banks, such as structured investment vehicles (SIVs) or money market funds, were at the source of the global financial crisis. They are legal structures that perform credit intermediation and maturity transformation.

Although the services provided by banks in financial markets are interrelated, we can distinguish six categories of increasing complexity (Dermine, 2015 and 2017): underwriting and placement, portfolio management, payment (transmission) services, monitoring or information-related services, risk sharing, and advisory services.

Underwriting and placement: A first service provided by banks is to bring together savers and borrowers. Underwriting and placement of securities – bonds or shares – helps borrowers (corporate firms or public institutions) to meet surplus units, and structure or customize the type of securities that meet the risk/return requirements of borrowers and lenders. In this function, the underwriter is involved not only in designing the security, but also in the valuation of assets and the pricing of securities to ensure that the terms of the issue are competitive. As investors may wish in the future to transform these claims into cash, consumption or other securities, they need to be exchanged. Brokers/dealers or market makers provide these services to ensure secondary trading and liquidity. In a pure underwriting and placement service, it is assumed that the return and risk of the securities can be properly defined, so that there is no major problem of asymmetric information (agency problem) between lenders and borrowers. In this case, monitoring is not an issue. With the underwriting and placement service, the end-investor holds directly the claims on deficit units.

Portfolio management: Investors can acquire at a low cost a diversified portfolio of securities issued by deficit spending units. Mutual funds and UCITS supply a diversified portfolio to the holders of its shares. The income derived from the financial assets is paid to shareholders less a fee paid to the fund manager. These funds exist for three reasons: To reduce the divisional costs incurred in issuing many securities, to provide a diversified portfolio to investors, and to delegate asset management to specialists who can assess economic prospects.

Payment system: A third function of financial markets is the management of the payment system, i.e. to facilitate and keep track of transfers of wealth among individuals. This is the bookkeeping activity of banks realized by debiting and crediting accounts on centralized ledgers.

Monitoring and information-related services: Private information held by borrowers leads to contracting problems, because it is costly to assess the solvency of a borrower or to monitor his/her actions after lending has taken place (Stiglitz and Weiss, 1981). Sometimes, it is useful to package these claims in a portfolio, and banks perform a useful function in reducing the costs of screening and monitoring borrowers. The delegation of screening and monitoring to banks has been shown to be an efficient mechanism (Diamond, 1984). This fourth category is linked to the first (underwriting and placement) but listed here as a separate service as it corresponds to those cases where significant information asymmetries make it difficult to issue financial claims traded on securities markets. While the second service (portfolio management) refers to the management of liquid assets, this fourth function refers to the management of an illiquid loan portfolio, often the largest part of a bank's balance sheet. It concerns primarily lending to consumers and small and medium size enterprises (SMEs).

Risk-sharing service: An increasingly important function of banks is to make the market more complete, i.e. to provide some form of insurance against multiple sources of risk. First, banks not only supply diversified assets, but also organize efficiently the distribution of risky income earned on the asset pool. The debt holders receive a fixed payment while the shareholders receive the residual income. Other insurance services include interest rate insurance (floating rate lending with various ceilings on interest rates called *caps or floors*), and liquidity insurance, i.e. option for a deposit holder or the holder of a line of credit to withdraw cash quickly at its face value (Diamond and Dybvig, 1983; Farhi and Tirole, 2017).

Advisory services: Advisory services to corporations and individuals are a significant source of fee income. Advices on mergers & acquisitions or risk management to corporations, as well as on asset management, tax or succession planning to individuals are all services offered by banks.

In the next two sections, we identify technological innovations and evaluate how digital technology could disrupt the offering of bank services.

Section 2. Disruptive Technology in Banking, a Historical Perspective

The following sections review briefly the technological innovations and their impact on the banking industry: electronic processing of data, telephone banking, internet, smart-phones, blockchain decentralized ledger technology, cloud computing, and applications of artificial intelligence with robo-advisors.

Electronic processing of data. A major breakthrough that affected the payment system was the move from manual entry of debit/credit in a centralized book ledger, to machine-readers of checks, and subsequently electronic payments. The payment business relies on the mastering of electronic data processing with debit and credit of accounts. In this area, banks have no source of competitive advantage vis-à-vis tech firms such as telephone or internet companies, as illustrated by the proliferation of new entrants/payments systems, including the mentioned M-Pesa, PayPal, Apple Pay, Samsung Pay, and Alipay developed by the Chinese retailer Alibaba.

Telephone (minitel) banking: A major benefit of telephone (minitel) banking was that access to bank information (such as to the account balance) and transactions could be initiated from any location outside the bank's branch and processed automatically with electronic data processing.

Internet: Compared to telephone banking, the internet allowed millions of users to access data more easily from distant locations and facilitated the entry of transactions. Coupled with the development of mathematical algorithms, it allowed the clearing and settlement of securities trade at low cost. This facilitated the entry of online brokerage and asset management firms such as Boursorama and Cortal in France, Banco BIC in Portugal or Binckbank in the Netherlands, Belgium and France. More recently, the internet and mathematical

algorithms combination has allowed the matching of investors and borrowers. The case of peer-to-peer lending (P2P) is discussed in the next section.

Smart-phone with sensors: Smart-phones that combine computer power and internet access allow banking at any time, any place. In addition, sensors collect data on customer habits which allows big data analytics.

Blockchain decentralized ledger technology: Until recently, trust in the economy with records of cash account balances or real estate property was based on centralized bank or public ledgers. This helps to facilitate payment and real estate transactions. The application of cryptography and internet networks permits the development of a decentralized ledger technology. It was first applied to the cryptocurrency bitcoin.

Cloud computing: Progress in storage and transmission of data allows the aggregation of data and softwares in specialized places on the 'cloud'. This has an important impact on the bank value chain. Data and softwares no longer need to be stored in-house but can be stored with a third party. Smaller firms can benefit from lower cost generated by economies of scale of the cloud company specialists.

Artificial Intelligence and Robo-Advisors: It has long been expected that increased computing power and artificial intelligence would contribute to automatize effectively repetitive tasks performed by humans. Competition between robots and humans arose first in popular games. In 1997, *Deep Blue* of IBM defeated the chess world champion Kaskapov. More recently in 2016 *AlphaGo* of Google defeated Lee Sedol a Korean grand master in the sophisticated- game of Go. IBM has invested significantly in artificial intelligence with the project *Watson*. It could have application in the field of medicine, law and finance. In the field of asset management, two of the highest performing hedge funds, Two Sigma, are managed by algorithms. In private banking, start-up firms such as *Betterment* in USA offers fully automated private banking and asset allocation services.

Section 3. Banking Services and Disruptive Digital Technology

To understand the impact of digital technology on banking markets, it is useful to group some of the banking services discussed in Section 1 into three categories: those related to data processing, to data analysis, and to the bank's unique balance sheet structure, as in Table 1.

Table 1: Banking Services

| Data Processing | Data Analysis | Bank's Balance Sheet |
|--|---|---|
| Payment | Lending to SMEs (with evaluation of risk, collateral, monitoring of risk, restructuring, recovery) | Non-maturing deposits: safe (as backed by a diversified loan portfolio, banks's equity and deposit insurance) and liquid (withdrawable on demand) |
| Brokerage of securities (shares and bonds), passively managed investment funds | Advisory (corporate finance and risk management) | Credit lines (borrowers can access liquidity on demand) |
| Consumer Loans (credit risk is quantifiable, commoditized) | Asset Management and private banking (advisory on estate planning, actively managed funds, structured products) | |

The first column lists banking services that involve mostly electronic data processing. They include payment with debit and credit of accounts, brokerage of securities including trading with algorithms, and the distribution of passively managed funds. It includes consumer loans for which credit risk can be quantified with external discriminatory factors. Easy access to external data and statistical packages to evaluate credit risk implies that the risk is commoditized. As this first set of services requires expertise in data processing and not in banking, they are attractive to new competitors. Entrants into the payment business by PayPal or ApplePay and in international money transfers (TransferWise) illustrate the significance of the threat.

In many cases, banks have been able to respond. In France, they joined forces to introduce Paylib for online payment. In the online securities brokerage industry, Boursorama and Cortal have fought off competition, but have seen a significant reduction of the fee per transaction. Other industry

responses have been cooperation with telephone companies (such as Apple), but again with a reduction of bank revenue due to sharing. Finally, when credit risk is quantifiable with external data and commoditized, it becomes a data processing game. This explains the success of Lending Club in penetrating the US unsecured consumer loan market. This is discussed in Section 4.

The second column includes services that require data analysis and specific banking expertise. Lending involves not only a supply of funds, but also the control of risk via assessment of collateral and, when the economy dives, loan restructuring and recovery. This requires specific banking expertise that cannot be easily copied by data processing specialists. Artificial intelligence promises significant efficiency gains which could be provided by incumbent banks or by new players.

The third column includes banking services that rely on the unique balance sheet of banks and their ability to mismatch maturities. As stated above, banks provide liquidity insurance services in both deposit and credit markets by relying on large pool of depositors and borrowers. This service cannot be easily imitated by pure data processors and brokerage platforms. Lending Club, it will be observed, does not engage in maturity mismatch but offers matched-maturity medium-term investment.

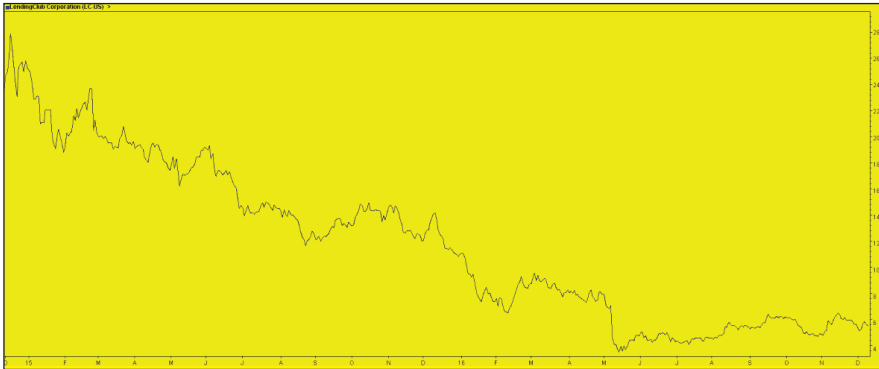
From this we can conclude that data-processing activities are under threat from specialist companies such as telephone or internet companies. India, for example, has recently granted banking licenses to telephone operators to steer competition. On 6 January 2016, the French telephone operator Orange announced the purchase of the insurer Groupama's bank to launch a mobile bank. After several delays, the launch is taking place on 2 November 2017, an event that will be closely monitored. Banking services that are quantifiable with external data and commoditized are also subject to competition, such as Lending Club in the consumer credit market. A fundamental question arises as to whether banks will be affected by the loss of payment business and exclusive client relationships. Agile banks can adjust by offering alone or in partnership the omni-channel distribution to meet the needs of the clients, but often with a reduction of bank revenue, which in turn implies pressures to reduce operating costs.

Section 4. Peer-to- Peer Lending, the Case of Lending Club

As bank lending is fundamental for the economy, a specific analysis of digital disruption in the lending market follows. This is best illustrated by America's Lending Club, which has attracted a significant attention due in part to a successful IPO in December 2014 and the presence of well-known individuals on its board, such as Larry Summers, former US Treasury Secretary, and John Mack, former president of Morgan Stanley. Founded in 2006 in San Francisco by the French entrepreneur Renaud Laplanche, it is essentially a brokerage platform matching investors to individual borrowers. On the first day of trading (12 December 2014) the price of its shares issued at \$15 jumped to \$24.75, a 65 per cent gain. It implied a price-to-book of 7, comparable to that of Facebook.

Initially dubbed 'peer-to-peer (P2P) lending' with individuals financing individuals, it has evolved into 'marketplace funding' with large institutional investors such as pensions funds, hedge funds or other banks making these loans. According to Credit Suisse analysts (CS, 2015), the \$ 4 billion loan volume issued by Lending Club in 2014 could be compared to a total addressable market (TAM) of \$ 873 billion of unsecured consumer loans, reaching \$ 1,171 billion if one includes unsecured loans to small and medium size enterprises (SMEs). The claim of Lending Club is that, unencumbered by an expensive set of physical branches and outdated IT, it can operate with a much lower cost base, offering better returns to investors and cheaper loans to individuals. Available FICO credit scores on the credit worthiness of individuals in the US allows to classify credit risk and investors can diversify by investing pieces of \$25 into several loans. Lending Club relies on digital technology to solve the asymmetric information and divisibility issues mentioned earlier. On 26 October 2017 it was trading with a price-to-book of 2.4 and a share price of \$ 5.73, significantly below the December 2014 issue price of \$15.

Figure 1: Lending Club share price since IPO in December 2014..



The severe drop in the share price of Lending Club is due to its inability to meet initial growth forecasts. If there was a demand for cheaper loans used to refinance previous expensive bank or credit card loans, the supply of funds from institutional investors proved to be volatile. On 9 May 2016, the CEO founder Renaud Laplanche a 'totemic' figure of the industry resigned due to mis-selling \$22 million loans to Wall street investment bank Jefferies and a lack of full disclosure of a personal investment in a hedge fund in which LC was investing. On 23 May 2016, Shanda Payment Holdings Ltd, the Chinese investment group increased its stake in LC.

Jagtiani and Lemieux (2017) have analysed empirically the lending activity of LC. They find that Lending Club caters underserved areas (bank branches have been closed) or concentrated markets with lower spreads (for equivalent credit risk). They find that alternative information sources must be used as some borrowers with low FICO scores due to few or inaccurate credit reports have been able to access credit. They conclude that LC has enhanced financial inclusion.


One should take note of the very particular characteristic of the US banking market with a large reliance on credit scores developed by companies such as FICO, Experian or Equifax. In the United States, it is very difficult to obtain credit without a credit score and a long credit record history. In other countries, banks have applied statistical analysis with larger set of data to evaluate credit risk. The impact of P2P on financial inclusion in other countries remain to be analysed.

Section 5. Digital Disruption and Bank Lending: A Menu of Credit-Facilities

We have seen how P2P and marketplace funding could disrupt two banking services: the resolution of asymmetric information and the division of investment into small amounts to allow diversification. While it is too early to know whether the potential will become reality, two observations must be made about the benign economic circumstances which favor the growth of that industry: an ultra-low interest rate environment and an economic recovery in the US.

The ultra- low interest rate environment has created an appetite for riskier assets and credit risk spreads, with institutional investors searching for yield. Institutional money is known to be volatile and one can wonder whether the appetite of hedge funds for credit-related assets will be sustained in a rising interest rate environment. Besides ultra-low interest rate, a second factor has helped marketplace funding. The US economic recovery has shifted attention away from the downside risk of a recession and loan losses. It is obvious that lending is not just about matching investors and borrowers, it is also the business of controlling risk and managing non-performing assets. From that perspective, a remote internet-based company from San Francisco will be at a competitive disadvantage vis-à-vis banks with branches that are closer to its non-performing clients. The case of marketplace funding suggests that we classify lending into different types of credit risk and funding vehicles, as in Table 2.

Table 2: Digital Disruption and Lending

| Types of Loans | Bank Funding Vehicles |
|---|---|
| <p style="text-align: center;">Types of Loans</p> <p>High risk ('information sensitive': collateral valuation, risk monitoring, restructuring, recovery)</p> <div style="text-align: center;">  </div> <p>Low risk ('information insensitive', such as a mortgage with a low loan-to-value ratio)</p> | <p style="text-align: center;">Bank Funding Vehicles</p> <p>Insured deposits, unsecured deposits or bonds, subordinated debt and equity Banks keep 'skin in the game'</p> <hr/> <p>Securitized loans with several tranches – Shadow banking Under current international regulations, banks keep 'skin the game'</p> <hr/> <p>P2P, Marketplace funding Brokers do not keep skin in the game</p> |

Digital technology allows direct finance with the matching of borrowers and investors. It is a low cost competitor to the banking industry. However, as discussed above, lending is more than the matching of investors and borrowers. It involves the control of risk after lending has taken place, the trading of claims if investors need to access liquidity, and the management of non-performing assets. Given the complexity of these lending services, it is useful to rank assets according to the degree of credit riskiness (from high risk to very low risk) as shown in the first column of Table 2.

Higher credit risk implies a need for risk monitoring and a higher probability of having to deal with non-performing assets. Moreover, the presence of credit risk with asymmetric information between the holder of an asset and a potential buyer may lead to a market breakdown due to the classical fear of buying a 'lemon'. Such 'information sensitive' assets become illiquid in a recession, just when liquidity is most needed (Dang *et al.* 2013). For such assets, funding on the bank's balance sheet with a maturity mismatch allows the creation of liquidity and is something that cannot be replicated by a broker such as Lending Club that does not engage in maturity transformation.

At the other extreme are very safe assets, such as a mortgage with a very low loan-to-value ratio. These assets which are not affected by credit risk are

'information insensitive' and therefore liquid. A broker is well placed to offer financing vehicle at a low cost. Classifying loans from risky to very safe, one can argue that higher risk transactions will remain on the balance sheet of banks, that lower risk can be securitized and that very safe assets can be handled with marketplace funding. This does not necessarily imply market disruption as banks could replicate by offering similar products to investors.

Investors will face a menu of credit-related investment opportunities that will match their risk preference. Investors who have a strong aversion to risk - be it related to credit or liquidity - will prefer non-maturing bank deposits. With less risk aversion to credit and liquidity, they can invest in tranches offered by special purpose vehicles managing loan securitization. In these first two cases, the loan originating bank will keep skin in the game, reducing the agency problem with investors. The third set of credit-related investments offered by peer-to-peer lending will present the highest risk in terms of credit (no skin in the game for the brokerage platform) and liquidity risk.

A second empirical paper, Buchak *et al.* (2017), focuses on shadow banks in US residential market. Fintech represents a third of shadow banks. They observe that, besides the benefit of efficient digital technology, the growth in digital residential lending is related to two factors: regulatory arbitrage and access to government sponsored enterprises (GSE) with some form of government guarantee. Traditional banks retreat from market with high regulatory burden and this is filled by shadow banks. They observe a very large increase in the Federal Housing Administration (FHA) mortgage market which serves less credit worthy customers and is subject to highest regulatory or litigation costs. Moreover 80% of Fintech lending benefit from GSE and some form of government guarantee. One notices again in this second empirical paper very specific characteristics in the US residential loan market. They should be taken into account in assessing digital lending in other parts of the world.

Conclusion

With regards to the funding of loans, internet has facilitated P2P and marketplace funding. Furthermore, the environment for P2P has been extremely favorable, thanks to ultra-low interest rates and the expansion of

economic activity. Such a benign environment for marketplace funding may not last. Moreover, nothing stops a traditional bank from offering online a similar loan brokerage facility.

According to their risk aversion for credit or liquidity risks, investors will choose between safe non-maturing bank deposits, more risky tranches of securitized loan portfolios, or direct lending from digital platforms.

As was the case with securitization, public policy should ensure a minimum level of transparency for borrowers and investors. It must identify and control shadow banking with maturity mismatch, a major cause of a liquidity crisis. Banks have a unique role to play in providing liquidity and funding higher credit risk assets, which are often characterized by opacity and therefore illiquidity.

References

- Buchak G., Matvos, G., Piskorsli, T., and Seru, A. (2017). Fintech, Regulatory Arbitrage, and the Risk of shadow Banks, mimeo, University of Chicago.
- Credit Suisse (2015). Lending Club, Equity Research, 21 January, 1-22
- Dang, T. V., Gorton, G., and Holmström, B. (2013). Ignorance, Debt and Financial Crises, mimeo, 1-34.
- Dermine, J. (2015). Bank Valuation and Value-based Management, 2nd edition, McGrawHill, NY.
- Dermine, J. (2016). Digital Banking and Market Disruption, A Sense of *déjà vu*? Financial Stability Review, Banque de France, N° 20, April.
- Dermine, J. (2017). Single Resolution Mechanism in the European Union: Good Intentions and Unintended Evil, in Monetary Economic Issues Today, Festschrift in Honour of Ernst Baltensperger, editor Swiss National Bank, Orell Füssli Verlag, Zurich.
- Diamond, D. W. (1984). Financial Intermediation and Delegated Monitoring. Review of Financial Studies, 51, 393-414.
- Diamond, D. W., and Dybvig, P. (1983). Bank Runs, Deposit Insurance and Liquidity. Journal of Political Economy, 91, 401-419.
- Fahri, E., and Tirole, J. (2017). Shadow Banking and the Four Traditional Pillars of Traditional Financial Intermediation. CEPR discussion paper 12373.
- Jagtiani J., and Lemieux, C. (2017). Fintech Lending: Financial Inclusion, Risk Pricing, and Alternative Information. Working paper # 17-17, Federal Reserve Bank of Philadelphia
- Stiglitz, J., and Weiss, A. (1981). Credit Rationing with Imperfect Information. American Economic Review, 71, 393-410.

The Future of Banking: From Scale & Scope Economies to Fintech²⁹

by Arnoud W.A. Boot³⁰

Abstract

Information technology plays a leading role in the transformation of banking. The deepening of financial markets has profoundly affected the business of banking. The recent focus on fintech – basically, new technology-driven players entering the financial services industry – is the latest manifestation of the impact of information technology on the industry.

This paper will focus on the structure of the banking industry going forward. We will try to draw lessons from the (older) literature on scale and scope economies in banking. Much uncertainty remains as fintech will lead to a disaggregation of the value chain, and will challenge the bank-customer interface at the core.

1. Introduction

The financial services industry is undergoing massive changes. Information technology is key in this process of change. The recent focus on fintech – basically, new technology-oriented players entering the financial services industry – is possibly the most visible manifestation of the impact that information technology has on the industry.

29. This paper updates Boot (2016).

30. University of Amsterdam and CEPR. Corresponding address: University of Amsterdam, Amsterdam Center for Law & Economics (ACLE), Plantage Muidergracht 12, 1018 TV Amsterdam, The Netherlands, e-mail: a.w.a.boot@uva.nl.

This paper will focus on the structure of the banking industry going forward. We will try to draw lessons from the (older) literature on scale and scope economies in banking, and relate these insights to the ‘modern’ world of information technology and fintech.

The impact of information technology on the industry is already going on for years. An important development is the impact of the proliferation of information technology on financial markets. It has deepened financial markets and via changes in the business models of banks strengthened the link between markets and financial institutions. The latter runs for example via securitization and other forms of asset sales that remove assets from a bank’s balance sheet allowing those assets to become tradeable. This intertwines markets and institutions and could amplify the impact of financial market conditions on banks (Shin, 2009).

Apart from providing all kinds of benefits (e.g., diversification, liquidity), a more negative view is that the enhanced opportunities to trade assets invites ‘excessive changeability’ and possibly more opportunistic behavior in banks that could undermine their stability. The linkages to the financial market facilitate a proliferation of transaction-oriented banking (trading and financial market) activities possibly at the expense of more traditional relationship banking activities (Boot and Ratnovski, 2016).

In this context also the ownership structure of banks might be important. The traditional partnership model in investment banking may have contained opportunistic behavior in that partners had their personal wealth tied up in the business, and could not easily leave and liquefy their ownership claim. In a sense, the marketability of their own involvement (human capital) was severely constrained which may have countered the fluidity of banking activities itself. Also here information technology and the deepening of financial markets may have been instrumental in creating a more fluid ownership structure based on a stock market listing.

We will discuss these developments, and subsequently address – what *The Economist* has called – the fintech revolution.³¹ Can we draw insights from the extensive literature on scale and scope economies in banking? We will argue that only limited insights are available. Most recent empirical work identifies

31. ‘The Fintech Revolution’, *The Economist*, May 9th, 2015.

some scale economies, yet faces difficulties in identifying true scope advantages. And what is particularly missing in the literature, is the impact that information technology may have on the industry. ‘Fintech considerations’ have not been part of this literature.

The organization of the paper is as follows. In section 2 we focus on the impact of information technology and the deepening of financial markets on the transaction- versus relationship-orientation of banks. Section 3 discusses ownership structure issues. Scale and scope economies are discussed in Section 4. Section 5 focusses on the impact of fintech on the banking industry. In particular, we focus there on how it might disaggregate the value change (and my put the customer interface at risk for banks), and to what extent banks will hook-up to fin tech players, and/or become fintech players themselves. Concluding observations are made in Section 6.

2. Information technology and transaction orientation³²

An arguably not much contested observation is that banks have become more transaction oriented. As *The Economist* put it over twenty years ago in the context of the experience of securities firms:

“Perhaps the worst feature of the 1980s – which has subsequently returned to haunt the securities firms – was the abandonment by most of them of the old relationships with their customers. [...] “The aim was to do a deal, any deal”, remembers one manager who prefers not to be named” (*The Economist*, April 15, 1995, Special Section: A Survey of Wall Street, p. 13).

While this quote was made over twenty years ago, it is interesting to note that when financial markets prosper they appear to push financial institutions away from their relationship banking franchise. As the consultancy BCG puts it (explaining the surge in transaction oriented activities in 2004-2007): “... Amid surging economies, low loan losses, and readily available cheap capital, it did not really matter whether a bank had top- or bottom-quartile capabilities [...]. All that mattered were workable sales processes” (BCG, 2010).

The modern world of information technology and deepening of financial

32. This section follows in part Boot (2011) and Boot and Ratnovski (2016).

markets has clearly induced banks to become more heavily exposed to the financial markets. Doing transactions has become easier, and hence market-linked activities like securitization and proprietary trading have become more prominent. At a more fundamental level, what this points at is the scalability of transaction-oriented activities (Boot and Ratnovski, 2016). Subject to available capital, banks can quickly increase their exposure to those activities. Relationship-based activities are more constrained as they depend on employing human capital and engaging with potential clients. Thus transaction-oriented banking is not only more susceptible to a sudden spur in momentum, but also the feasibility of financial institutions to quickly mobilize resources and give in to such opportunities seems greater than for relationship banking activities.

The competitive dynamics plays an important role. When financial markets are exuberant, banks that abstain from, for example, trading activities – one of the financial market activities that can be expanded quickly – may look less profitable and might feel ‘left behind’ in the earnings game vis-à-vis other banks. This is precisely what happened with UBS, one of the bigger victims in the 2007-2009 crisis. An internal investigation in 2008 – following massive losses on subprime investments – discovered that its troublesome subprime investments were undertaken following pressure from external consultants that pointed at its fixed income activities that were lagging those of competitors. To fill this gap UBS was advised “to close key product gaps” which explicitly referred to subprime investment vehicles (UBS, 2008, page 11).

A more subtle concern is that opportunistic trading may undermine relationship banking. Boot and Ratnovski (2016) show that banks may allocate too much capital to transaction-oriented activities and in doing so have insufficient risk-bearing capacity for relationship banking. Banks may also underestimate the risks involved, and implicitly subsidize the transaction-oriented activities at the expense of relationship-oriented activities. More specifically, proprietary trading might be granted an artificially low cost of capital. Other – mainly relationship-oriented activities – are then implicitly taxed and appear less profitable than they really are. Thus, proprietary trading could undermine a bank’s competitive edge in its relationship banking business.

A related mechanism is that such transaction-oriented activities initially appear very profitable (as long as the boom lasts), and that during that time those departments – and the individuals involved in them – will gain power.

What this might do is that power shifts from people engaged in more prudent relationship banking activities to those engaged in transaction activities. This may affect the overall balance of power in an institution via promotions in the corporate hierarchy, and may tilt power away from its relationship banking franchise. As a consequence relationship banking may suffer.³³

The extensive work in the field of financial intermediation points at the distinct value of relationship banking. Importantly, however, much of this research predates developments in information technology that have facilitated ‘more distant’ banking operations. While we continue to believe in the importance of relationship banking, information technology – particularly, the way information can be obtained from data analysis (Big Data), and, for example, the proliferation of interactions via social media – will have an impact on how relationship banking can add value. In particular, payment systems and distribution channels are changing rapidly, and this will affect the business of banking and the competitive positioning of banks as distinct financial institutions. We will come back to this when we discuss fintech, and particularly the disaggregation of the value chain that it may entail.

3. Ownership structure: partnerships, stability and institutional franchise value

As stated, the deepening of financial markets and information technology in general may have caused excessive ‘changeability’ and tradeability in the industry. We pointed at the opportunistic behavior that this may cause. An important link can be made to the ownership structure and stability of investment banks versus commercial (relationship oriented) banks.

Traditional relationship-oriented banks seem incentivized to build up *institutional* franchise value. Individuals are part of the organization as an entity, and the continuity of the organization and lasting relationships with

33. These ‘power’ considerations deserve more attention in research. Much of the focus has been on remuneration contracts, while incentives running via promotion opportunities and power might arguably be as important or even more important. A direct link could also exist with the pricing of risk in financial markets. If risks in ‘booming’ times are underpriced (or under estimated), this would further push banks in such euphoric times toward transactions, like trading activities (Boot, 2014).

its clientele define its value. The value cannot be transferred and cannot readily be assigned to individual stars. In other words, the value created is an integral part of the organizational entity (i.e. 'franchise value') and not portable as part of individuals.

Investment banks on the other hand, particularly their trading and transaction activities,³⁴ seem more based on the individual star concept with high marketability of individuals. As a consequence, less institutional franchise value is built up; individual franchise values dominate. If this is the only difference then a relationship banking institution has substantial implied franchise value, while the investment bank has less of it, and hence Keeley's (1990) analysis would suggest that an investment bank would take lots of risk, while the franchise value of a commercial bank would help curtail its risk taking.

Historically investment banks have solved the marketability problem – and the potential lack of institutional franchise value – by having partnerships. The partnership structure has two dimensions that could help jointly resolve the marketability problem, and related opportunistic, risky behavior (and star phenomenon):

- a partnership means that bankers have their personal wealth tied up in the business –they own the equity claim of the business;
- the partnership structure is such that the equity is not (optimally) marketable.

The latter implies that 'stars' cannot take their money out, or only at a reduced value. Implicitly, this means that non-portable franchise value is created, and this value is transferred over time to future partners. As an additional argument, partnerships ensured a relatively high capitalization which directly augmented the franchise value at risk. Interesting examples exist where institutions have made changes that have destroyed this structure. For example, with a go-public transformation (converting a partnership in a listed shareholder owned company) the current partners effectively expropriate all franchise value

34. Activities of investment bank often are (were) relationship based, more recently trading dominates, which is not. In recent times, traders appear to have gained power within investment banks, e.g. more recent leaders of Goldman Sachs came from the trading side. In any case, we do not see the distinction between commercial banking and investment banking as an absolute dichotomy.

that has been built up over time.³⁵ Even worse, once the partnership is gone, stars may no longer be ‘under control.’ Their financial interest is no longer tied to the firm. This may elevate risk and reduce stability.³⁶

In commercial banking the enhanced marketability – and with it, transaction focus – may have opened the door for some type of star phenomenon as well. In a sense, it may have brought commercial banking closer to investment banking, and similar issues might be at play. This may have induced opportunistic behavior particularly because partnership structures in commercial banking never have been very common.

In any case, partnerships among major financial institutions are rare. The important point however is that via enhancing marketability the demise of partnerships could have undermined stability. As a caveat, all this does not mean that there might not be distinct benefits associated with these developments as well. What we have stressed is the potential downside. We are however prepared to conclude that the financial crisis has made us look more favorably at alternative ownership structures like mutual, cooperative banks (e.g. Credit Agricole in France) and, indeed, partnerships. Also, diversity in ownership structure might have become more appreciated. After all, one of the problems of the increasing intertwined nature of banks and markets is that it might make banks look more alike, and that could induce systemic risk. Diversity in ownership structures might help counter this.³⁷

4. Scale and scope economies in banking

What drives financial players in choosing their scale and scope of operations? This question is important because the size and particularly the

35. Morrison and Wilhelm (2007; 2008) analyze the decision of major US investment banks to go public. Investment banks were initially organized as partnerships. The opacity of partnerships and illiquidity of their shares allowed for successful mentoring and training in tacit non-contractible human skills, such as building relationships, negotiating M&A deals and advising clients. They argue that IT technology necessitated heavy investments and that that necessitated investment banks to go public. Potentially confirming this is that wholesale-oriented investment banks such as Morgan Stanley for which tacit human capital was more important than IT technology went public later than retail-oriented investment banks such as Merrill Lynch.

36. Publicly listed firms sometimes use restricted stock to create some fixity in the ownership structure, and continued loyalty of key personnel.

37. Schellhorn (2011) emphasizes the (unlimited) liability of partners as stabilizing factor, and recommends a private partnership form for investment banks. See also Berger et al (2008).

complexity of financial institutions is a concern to regulators and supervisors. More recently, the question is what impact fintech and information technology will have on bank business models, and the scale and scope of banks. Research on this remains rather inconclusive, or in the words of Richardson, Smith and Walter (2010): “Indeed, the recent studies mirror the findings [...] some 15 years earlier [...] there was no predominance of evidence either for or against economies of scale in the financial sector.” This precedes the fintech revolution, so it is not clear whether this remains true.

Observations on scale and scope

A first observation is that banks like to *combine* many different activities. This distinguishes banks from many of their competitors, e.g. non-banking financial institutions like mutual funds and finance companies. The latter often choose to specialize and therefore are much more transparent. Banks generally choose to diversify their activities. Although few would readily deny that some degree of diversification is necessary, banks seem to engage in a very broad variety of activities.

Particularly in Continental Europe, the size (and scope) of banks is enormous. One explanation could be that implicit or explicit government guarantees and too-big-to-fail (TBTF) concerns give artificial competitive advantages to size (Feldman, 2010). Universal banks, while not particularly efficient, might have sufficient ‘protected’ revenues to compete with more focused players.³⁸

Scale and scope economies are often cited as rationale for why financial institutions tend to growth in size and complexity (scope) over time. But are scale and scope economies truly present? Sources of scale and scope economies include (see Boot, 2003; and Walter, 2003): *i.* information-technology related economies; *ii.* reputation and marketing/brand name related benefits; *iii.*

38. Indeed, this is one of the complaints of more focused investment banking institutions. Universal banks can leverage their balance sheet (read: cross subsidize) to secure investment banking business (e.g. *Financial Times*, March 21, 2011, page 17: “US banks face fresh scrutiny on lending”). Some evidence exist on TBTF benefits. Jagtiani and Brewer (2013) find that investors are willing to pay a premium when an acquisition would create a bank with assets over \$100 billion. Rime (2005) finds that banks above some threshold tend to have higher credit ratings and Baker and McArthur (2009) show that banks that have more than \$100 billion in assets have lower costs of capital. Becalli, Anolli and Borello (2015) show that scale economies are larger for banks that are designated as systemically relevant by the European Commission.

(financial) innovation related economies; and *iv.* diversification benefits. Information technology related economies particularly refer to back office efficiencies and distribution-network related benefits. Transaction processing offers distinct scale economies. And information technology developments facilitate an increasing array of financial products and services to be offered through the same distribution network, and thus allow for cross selling. Reputation and brand name/marketing related economies may be present in the joint marketing of products to customers. Brand image is partially marketing related, but is also related to the notions of ‘trust’ and ‘reputation.’ (Financial) innovation related economies particularly refer to large(r) institutions that might be in a better position to recoup the fixed costs of those innovations.

Diversification benefits are (at first sight) more controversial. In many cases, conglomeration may lead to a valuation discount which could point at (anticipated) inefficiencies. This is in line with corporate finance theory that tells us that investors can choose to diversify and that this does not need to be done at the firm level. However, key to the business of banking is risk processing and absorption. And confidence in a bank requires it to be safe. Diversification is then needed to be able to absorb risks and be safe. Observe also that several bank activities benefit from a better credit rating, which suggests that diversification at the level of the bank has value.³⁹

Are scale and scope benefits real?

Scale and scope economies in banking have been studied extensively. In a 18 year old survey paper Berger, Demsetz and Strahan (1999) conclude that, in general, the empirical evidence cannot readily identify substantial economies of scale or scope. Illustrative is also Saunders (2000). He cites 27 studies, 13 of which found diseconomies of scope, 6 found economies of scope and 8 were neutral.

An important caveat is that this research mainly involves U.S. studies using data from the 70s and 80s. Apart from potential methodological shortcomings, the results therefore do not capture the dramatic structural and

39. For many guarantees or contracts and activities that involve recourse, the credit standing of the guarantor is crucial for the credibility of the contract. Mester (2008) emphasizes that bank production decisions affect bank risk. Scale and scope related decisions have via diversification an effect on risk, and that in turn may affect choices about risk exposure. Goetz, Laeven and Levine (2016) show the existence of diversification of risk benefits in domestic geographic expansion of U.S. bank holding companies.

technological changes in banking that have taken place since then. Furthermore, they reflect the historic fragmentation of the U.S. banking industry due to severe regulatory constraints on the type of banking (banks could engage in commercial banking or investment banking, but not both) and the geographic reach of activities (limits on interstate banking) that were present till the deregulation in the 90s (see Calomiris and Karceski, 1998).

Some more recent studies examine the existence of a diversification discount for financial institutions. Laeven and Levine (2007) confirm the existence of a diversification discount in banks that combine lending and non-lending financial services, and suggest that the potential economies of scope in financial conglomerates are not large enough to compensate for potential agency problems and inefficiencies associated with cross-subsidies.⁴⁰ Rajan, Servaes and Zingales (2000) emphasize that, even though conglomerates trade at a discount on average, 39.3% of the conglomerates trade at a premium. They show that the interrelation between activities within the conglomerate is of crucial importance. Diversified firms can trade at a premium if the dispersion between activities is low. High dispersion induces inefficiencies which point at the importance of focus within the conglomerate. In particular, one should look at what type of mergers and acquisitions involve scale and scope benefits. Recent research suggests that mergers with both a geographic and activity focus are most value enhancing. Similarly, in analyzing scope and scale issues, one should focus on the type of activities. What are the scale economies in each activity? And what product-mix offers true scope economies?

DeLong (2001) looked at the shareholder gains – more specifically, the immediate announcement effect on share prices – from focused versus diversifying bank mergers in the U.S. between 1988 and 1995. She found that focused mergers, both on the level of activity and geography, have positive announcement effects. Moreover, focus in activities was shown to be more important than geographical focus, albeit the latter was important as well. Activity-diversifying mergers had no positive announcement effects. These results point at the presence of scale rather than scope economies.

40. Schmid and Walter (2009) confirm the Laeven and Levine (2007) results, and confirm that this discount is indeed caused by diversification, and not by inefficiencies that already existed before the diversification. Chevalier (2004) shows that controlling for the pre-conglomeration performance of businesses is important: inefficiencies measured after a merger often already existed prior to the merger.

The typical result in these earlier studies was, however, that even scale economies were exhausted at relatively small bank sizes. Later evidence points at more persistent scale economies. Wheelock and Wilson (2009); and Feng and Serletis (2010) find increasing returns to scale and Elsas, Hackethal and Holzhäuser (2010) find increasing returns to scope also for larger financial institutions. Substantial scale economies are found when it comes to back-office activities and payments.⁴¹ Apart from methodological issues (see Mester, 2010), this might be driven by information technology developments that might only have showed up in more recent data.

In this spirit, researchers have looked at whether there are scale economies in investments in IT as suggested by Boot (2003) and Walter (2003). The evidence is somewhat mixed. Erber and Madlener (2009) find no significant relationship between IT capital investments and bank productivity at the country level. Beccalli (2007) even finds a negative relationship between bank efficiency and investment in hardware and software, but a positive relationship between bank efficiency and country-level bank spending on IT consulting services. Koetter and Noth (2013) find that merely increasing IT investment does not lead to higher profitability, but that the efficiency in employing IT matters.

The impact on IT on bank business models has so far not really been empirically investigated. One could envision that on the demand side, the proliferation of savings products and their link to pensions, mutual funds and life insurance clearly pushes for joint distribution, and suggests economies of scope in distribution. IT developments might have made it possible to better exploit potential scope economies with multiple product offerings to a particular customer group, using new direct distribution channels with relatively easy access to (formerly) distant customers. All this might also invite new competition as physical presence in local markets might have become less important. The term 'fintech' is associated with this development. As a consequence (as we will see next) the value chain may break up. A key question then is who will have the customer interface.

41. See Hughes and Mester (2015), Davies and Tracey (2012) and DeYoung (2010).

5. The impact of fintech on the banking industry

A key manifestation is that fintech may lead to the disaggregation of the value chain. Interfaces may come about that help bundle the product offerings of different providers, thereby becoming the direct point of contact for customers. The distribution related economies that we eluded to may actually lead to such disaggregation of the value chain.

*Online platforms and disaggregation*⁴²

Online platforms could disrupt existing financial institutions. Disaggregation of the value chain could follow from online platforms becoming the preferred customer interface. Online platforms could offer a supermarket type model facilitating access to various products and services of disparate providers along with record keeping. Technology firms such as Google, Facebook, Amazon or Apple may use a payments solution such as Apple Pay as a platform and gain direct customer interface for related products and services. Legacy financial institutions then might be relegated to serving as the back office to the platform.

The disruptive forces affecting banking – information technology and fintech in particular – may also offer new opportunities for other businesses that have tried to enter banking. For example, Tesco, a large UK supermarket chain provides banking services to its customers under its own brand. There is also no reason why a platform should be limited to offering only financial services. A life-style oriented focus could integrate financial and non-financial offerings. The financial services platform might act as a market place where people interact directly and financial institutions serve the limited role of an advisor or broker. P-2-P lending has parties transacting directly without the benefit of a financial intermediary (except possibly for back office services).

New specialized lenders have arisen that seek to replace relationship lenders and traditional credit scoring with sophisticated algorithms based on Big Data mining. While still in its infancy, such analysis predicts creditworthiness by analyzing buying habits, memberships, reading proclivities, lifestyle choices and all manner of opportunistic demographic correlates. Similarly, the growing

42. The observations follow in part Greenbaum et al (2016).

availability of inexpensive information allows for public certification of creditworthiness similar to the trustworthiness scores on eBay, or the client satisfaction scores on TripAdvisor. One could envision similar developments enabling P-2-P lending as well. Whether society will accept the widespread use of these data is a different matter. In any event, more and more potentially sensitive personal information can already be obtained with a few mouse clicks. Big Data may also facilitate crowdfunding, another form of direct lending involving multiple lenders and a singular borrower.

At the customer level, we may see a (re)emergence of more community oriented arrangements. As P-2-P lending and crowdfunding suggest, customers may take matters in their own hands; empowerment thus. Local arrangements may emerge where communities organize their financial affairs directly among themselves. Information technology therefore may not only invite an increase in scale, but might also facilitate more tailor-made local arrangements. The latter would fit the empowerment that customers may increasingly desire.

This point is more general. Many of the recent fintech related developments may put customers in the driving seat. For example, the platforms would give them easier access to a variety of providers.⁴³ The consultancy McKinsey talks about platforms creating ‘a customer-centric, unified value proposition that goes beyond what users could previously obtain...’ and is ‘often more central in the customer journeys’ (McKinsey, 2017). This points at empowerment by customers, and simultaneously casts doubts on whether banks are able to continue to control the customer interface.

Reach of fin tech in payments

An area which seems most open to fintech is payments, and particularly retail-related payments. This core area of banking is being coveted by technology firms and payment specialists like Google, Apple and PayPal. Thus far, banks have maintained their central role in payments. Also, the payments innovators are not typically independent of banks, but have developed in joint ventures or other types of alliances with traditional banks. In some countries, banks themselves have managed to offer the leading on-line payments solution.⁴⁴

43. See also a report on fintech by the consultancy Accenture (Accenture, 2014, page 10).

44. Oliver Wyman (2014) and BIS (2014).

Regulatory developments, like PSD2 in the EU, may further elevate competition in this area. PSD2 forces banks to share payment information with others on the request of their customers. This is designed to encourage competition in the payment sphere.

While retail payments were the initial point of entry of fintech players, getting into payment solutions for corporates might be a next step.

And banks?

What role will banks play in these developments? They may face challenges. As a report by the McKinsey consultants Hirt and Millmott puts it: “Digitization often lowers entry barriers, causing long-established boundaries between sectors to tumble. At the same time, the “plug and play” nature of digital assets causes value chains to disaggregate, creating openings for focused, fast-moving competitors. New market entrants often scale up rapidly at lower cost than legacy players can, and returns may grow rapidly as more customers join the network” (Hirt and Millmott, 2014).

This does not mean that banks are doomed. In the past, banking institutions have shown remarkable resilience, despite questions about their viability. As far back as 1994, economists John Boyd and Mark Gertler commented on the predicted demise of banks in a well-known study titled, “Are Banks Dead? Or Are The Reports Greatly Exaggerated?”.⁴⁵ At that point, the discussion was about the banks’ role in lending. In particular, the question was whether securitization would undermine the banks’ lending franchise. They concluded that while securitization would make banks less important for the actual funding of loans, the core functions of banks in the lending process – origination (including screening), servicing and monitoring – would be preserved, as would the centrality of banks. Also, banks would typically play a role in the securitization vehicles by providing back-up lines of credit and guarantees of the commercial paper that funds many of the vehicles.

The message of that article undoubtedly has relevance today. Banks will respond and try to be players in the fintech world themselves. They may also set up platforms, and in this way hold on to the customer interface. Moreover, fintech often is facilitating, and thus a way to improve operations and existing

45. Boyd and Gertler (1994) and Samolyk (2004).

processes within banks. Big Data and data analytics could, for example, improve the lending processes of banks. Banks also play a role in P2P lending. Like in securitization, banks may hold on to essential functions in that lending process. This points at complementarities between banks and fintech players.

What remains true is that banks may face dilemma's, when is partnering with fintech optimal, and when is it not desirable? Such dilemma could play for example in partnering with Apple or Google in payments. Will banks continue to be important for such partnership, or only in the beginning, and redundant subsequently? For a strong stand on partnering, with the motto: 'Partner or perish' see a report by the consultancy EY (EY, 2017). It also argues that the major risk for a bank does not come from fintech players but from banks that are better at partnering.⁴⁶

Banks also have some competitive advantages. Banks benefit from the anxiety of people about the safety of their liquid wealth. The financial crisis of 2007-09 may have created anxiety about the stability of banks, but banks are still seen as the place where money is safe.⁴⁷ Whatever the popularity of Apple, will people trust technology companies in safeguarding their money? Being a bank with a license and an implicit guarantee from the government has value. Banks may also have valuable compliance expertise. Nevertheless, there are reasons to envision a potential decline. New competitors and the disaggregation of the value chain will put pressure on existing players.⁴⁸

6. Conclusions

Information technology plays a leading role in the transformation of banking. Developments in information technology and the related deepening of financial markets have pushed banks to more transaction-oriented activities, including trading, at the expense of relationship banking. Banking has become

46. See also McKinsey (2017) for a similar point, and *The Economist* notes that banks and fintech become increasingly collaborative (*The Economist*, Special Report, International Banking, May 6th 2017, page 12).

47. Vatanasombut, et al. (2008) highlight that trust plays a key role in the retention of customers with online banking. They also find that perceived security reinforces trust.

48. Much attention is devoted to the so-called blockchain technology that potentially allows for a decentralized system of record keeping and transactions. A payment system based on crypto currencies (e.g. bitcoin) is the most well known application (Nakamoto, 2008; Bank of England, 2014).

more fluid, and possibly opportunistic as a result. Financial markets also facilitated investment banks in moving away from the more stable partnership model to a more fluid shareholder owned public listing.

The latest incarnation of information technology has led to a ‘fintech revolution’ where banks face new competitors with different – more specialized – business models forcing a disaggregation of the value chain. With technology-driven solutions they offer alternatives to key banking services including payments and lending. An important question is to what extent existing financial institutions can be leading. Can they be at the forefront of new developments? For example, by absorbing fintech players and their innovations? Will banks and fintech be complementary and collaborative? Or will banks fade away, with new technology-linked players assuming prominence in the financial sector? While we have commented on the resilience of banks, only time will tell. Many questions, few answers.

Also from a financial stability point of view, the fintech revolution is challenging. The Bank of England has formulated the question whether “...the distress of failure of a technology-enabled alternative finance provider have implications for financial stability?” (Bank of England, 2015). We just do not know. The Dutch central bank has identified not just risks in the (new) fintech type operations and players, but also stability risks coming from existing institutions that could lose out in the technology race (DNB, 2016). But stability benefits are also eluded to. Fintech developments may increase diversity in the financial sector benefitting the resilience of the system. Or not... For example, robo-advice and risk management algorithms could lead to more uniformity, and induce herding, and thus have procyclical effects.⁴⁹ Again, many questions and few answers. A challenging research agenda lies ahead of us.

49. See Carney (2017) and DNB (2017) on comprehensive overviews of the implications of fintech for stability.

References

- Accenture (2014). The boom in global Fintech investment, see www.accenture.com.
- Baker, D., and McArthur, T. (2009). The value of the “Too Big to Fail” big bank subsidy. CEPR Issue Brief, September.
- Balachandran, B., Faff, R., and Theobald, M. (2008). Rights offerings, takeover, renounceability, and underwriting status. *Journal of Financial Economics*, 89 (2), 328-334.
- Bank of England (2014). Innovations in payment technologies and the emergence of digital currencies. *Bank of England Quarterly Bulletin*, Q3, 1-14.
- Bank of England (2015). One bank research agenda. Discussion paper, February.
- BCG (2010). Global corporate banking 2010: Crisis as opportunity. The Boston Consulting Group.
- Beccalli, E. (2007). Does IT investment improve bank performance? Evidence from Europe. *Journal of Banking and Finance*, 31 (7), 2205-2230.
- Beccalli, E., Anolli, M., and Borello, G. (2015). Are European banks too big? Evidence on economies of scale. *Journal of Banking and Finance*, 58, 232-246.
- Berger, A.N., Demsetz, R.S., and Strahan, P.E. (1999). The consolidation of the financial services industry: Causes, consequences and implications for the future. *Journal of Banking and Finance*, 23 (2-4), 135-194.
- Berger, A.N., Klapper, L.F., Martinez Peria, M.S., and Zaidi, R. (2008). Bank ownership type and banking relationships. *Journal of Financial Intermediation*, 17 (1), 37-62.
- BIS (2014). Payment, settlement and clearing in various countries. Updated September 2014. Available at: www.bis.org/cpmi/paysysinfo.htm.
- Boot, A.W.A. (2003). Consolidation and strategic positioning in banking with implications for Europe. *Brookings-Wharton, Papers on Financial Services*, 37-83.
- Boot, A.W.A. (2011). Banking at the crossroads. *Review of Development Finance*, 1, 167-83.
- Boot, A.W.A. (2014). Financial Sector in Flux. *Journal of Money, Credit and Banking*, 46 (1), 129-135.
- Boot, A. W. A. (2016). Understanding the future of banking: Scale & scope economies, and Fintech, in *The future of large internationally active banks*, Eds. A. Demirgüç-Kunt, D.D. Evanoff and G. Kaufmann. *World Scientific Studies in International Economics*, 55, November 2016, 429-448.
- Boot, A.W.A., and Ratnovski, L. (2016). Banking and trading. *Review of Finance*, 20 (6), October 2016, 2219-2246.
- Boyd, J. H., and Gertler, M. (1994). Are banks dead? Or are the reports greatly exaggerated? *Federal Reserve Bank of Minneapolis Quarterly Review*, 18 (3), 2-23.
- Calomiris, C.W., and Karceski, J. (1998). *Is the bank merger wave of the 1990's efficient?* Washington, D.C.: The AEI Press.
- Carney, M. (2017). The promise of Fintech – something new under the sun. Speech at Deutsche Bundesbank G20 Conference, by Bank of England Governor Mark Carney, January 25th.
- Chevalier, J. (2004). What do we know about cross-subsidization? Evidence from merging firms. *Advances in Economic Analysis and Policy*, 4 (1), 1218-1218.

- Davies, R., and Tracey, B. (2012). Too big to be efficient? The impact of implicit funding subsidies on scale economies in banking. *Journal of Money, Credit and Banking*, 46 (s1), 219–253.
- DeLong, G. (2001). Stockholder gains from focusing versus diversifying bank mergers. *Journal of Financial Economics*, 59 (2), 221–242.
- DeYoung, R. (2010). Scale economies are a distraction, in: *The Region*. FED Minneapolis.
- DNB (2016). Technological Innovation and the Dutch Financial Sector (in Dutch), working paper, De Nederlandsche Bank (Dutch Central Bank), January.
- DNB (2017). Innovation in the loan market: Prudential concerns for the financial sector and supervision. Policy paper, De Nederlandsche Bank (Dutch Central Bank), November.
- Duffie, D. (2010). The failure mechanics of dealer banks. *Journal of Economic Perspectives*, 24 (1), 51–72.
- Elsas, R., Hackethal, A., and Holzhäuser, M. (2010). The anatomy of bank diversification. *Journal of Banking and Finance*, 34 (6), 1274–1287.
- Erber, G., and Madlener, R. (2009) Impact of ICT and human skills on the European financial intermediation sector, in *Productivity in the financial services sector*, Eds. M. Balling, E. Gnan, F. Lierman and J.-P. Schoder, Chapter 10, 183–200.
- EY (2017). Unleashing the potential of FinTech in banking, report, September.
- Feldman, R.J. (2010). Size and regulatory reform in finance: Important but difficult questions, in: *The Region*, FED Minneapolis.
- Feng, G., and Serletis, A. (2010). Efficiency, technical change, and returns to scale in large US banks: Panel data evidence from an output distance function satisfying theoretical regularity. *Journal of Banking and Finance*, 34 (1), 127–138.
- Goetz, M., Laeven, L., and Levine, R. (2016). Does the geographic expansion of banks reduce risk? *Journal of Financial Economics*, 120 (2), 346–362.
- Greenbaum, S.I., Thakor, A.V., and Boot, A.W.A. (2016). *Contemporary Financial Intermediation*, 3rd edition, Elsevier/Academic Press.
- Hirt, M., and Millmott, P. (2014). Strategic principles for competing in the digital age. *McKinsey Quarterly*, May 2014, p. 1–14.
- Hughes, J.P., and Mester, L.J. (2015). Measuring the performance of banks: Theory, practice, evidence, and some policy implications, in: *The Oxford Handbook on Banking*, Eds. A.N. Berger, P. Molyneux, and J. Wilson, 2nd edition, Chapter 10, 247–281.
- Jagtiani, J., and Brewer, E. (2013). How much did banks pay to become Too-Big-To-Fail and to become systemically important? *Journal of Financial Services Research*, 43 (1), 1–35.
- Keeley, M. (1990). Deposit insurance, risk, and market power in banking. *American Economic Review*, 80 (5), 1183–1200.
- Koetter, M., and Noth, F. (2013). IT use, productivity, and market power in banking. *Journal of Financial Stability*, 9 (4), 695–704.
- Laeven, L., and Levine, R. (2007). Is there a diversification discount in financial conglomerates? *Journal of Financial Economics*, 85 (2), 331–367.
- McKinsey (2017). *Remaking the Bank for an Ecosystem World*. McKinsey & Company, report, October.

- Mester, L.J. (2008). Optimal industrial structure in banking, in: *Handbook of Financial Intermediation and Banking*, Eds. A.W.A. Boot, and A.V. Thakor, Amsterdam: North Holland, 133-162.
- Mester, L.J. (2010). Comment on Scale Economies, in: *The Region*. FED Minneapolis.
- Mollick, E. (2014). The dynamics of crowdfunding: An exploratory study. *Journal of Business Venturing*, 29, 1-16.
- Morrison, A.D., and Wilhelm, W.J. (2007). Investment banking: Past, present, and future. *Journal of Applied Corporate Finance*, 19 (1), 42-54.
- Morrison, A.D., and Wilhelm, W.J. (2008). The demise of investment banking partnerships: Theory and evidence. *Journal of Finance*, 63 (1), 311-350.
- Nakamoto, S. (2008). Bitcoin: A peer-to-peer electronic cash system. Working Paper. Available at: www.bitcoin.org.
- Oliver Wyman (2014). Payments are changing but how prepared are retail banks? Oliver Wyman Financial Services Point of View.
- Rajan, R., Servaes, H., and Zingales, L., (2000). The cost of diversity: the diversification discount and inefficient investment. *Journal of Finance*, 55 (1), 35-80.
- Richardson, M., Smith, R.C., and Walter, I. (2010). Large banks and the Volcker Rule, in *Regulating Wall Street: The Dodd-Frank Act and the New Architecture of Global Finance*, Eds. V.V. Acharya, T.F. Cooley, M.P. Richardson, and I. Walter, Wiley, 181-212.
- Rime, B. (2005). Do “too big to fail” expectations boost large bank issuer ratings? Swiss National Banks, Systemic Stability Section: Working Paper.
- Samolyk, K. (2004). The future of banking in America: The evolving role of commercial banks in U.S. Credit Markets. *FDIC Banking Review*, 16-2, 29-65.
- Sapienza, P. (2002). The effects of banking mergers on loan contracts. *Journal of Finance*, 57 (1), 329-368.
- Saunders, A. (2000). *Financial institutions management*, 3rd edn. McGraw-Hill: New York.
- Schellhorn, C.D. (2011). The ownership structure of investment banks: A case for private partnerships? *Academy of Banking Studies Journal*, 1 (1), 109-116.
- Schmid, M.M., and Walter, I. (2009). Do financial conglomerates create or destroy economic value? *Journal of Financial Intermediation*, 18 (2), 193-216.
- Schmid, M., and Walter, I. (2014). Firm structure in banking and finance: Is broader better? *Journal of Financial Perspectives*, 2-2, 65-74.
- Shin, H.S. (2009). Reflections on Northern Rock: The bank run that heralded the global financial crisis. *Journal of Economic Perspectives*, 23 (1), 101-119.
- Stein, J. (2002). Information production and capital allocation: Decentralized versus hierarchical firms. *Journal of Finance*, 57 (5), 1891-1921.
- UBS (2008). Shareholder report on UBS’s write-downs, 18 April 2008. Available at: <http://www.ubs.com/1/ShowMedia/investors/releases?contentId=140331&name=080418ShareholderReport.pdf>.
- Vatanasombut, B., Igarria, M., Stylianou, A.C., and Rodgers, W. (2008). Information systems continuance intention of web-based applications customers: The case of online banking. *Information & Management*, 45 (7), 419-428.
- Walter, I. (2003). Strategies in financial services, the shareholders, and the system: Is bigger and broader better? *Brookings-Wharton, Papers on Financial Services*, Vol. 2003, 1-36.

The Impact of Fintech on Banking

by Xavier Vives⁵⁰ ⁵¹

Abstract

The influence of fintech is beginning to be felt in the banking sector and capital markets. This article surveys its development and its impact on efficiency, banking market structure, strategies of incumbents and entrants, and financial stability. Fintech has a welfare-enhancing disruptive capability but regulation needs to adapt so that the new technology delivers the promised benefits without endangering financial stability.

Fintech may be understood as the use of innovative information and automation technology in financial services.⁵² New digital technologies automate a wide range of financial activities and may provide new and more cost-effective products in parts of the financial sector, ranging from lending to asset management, and from portfolio advice to the payment system. In those segments, the impact of fintech competitors is beginning to be felt in the banking sector and capital markets.⁵³ However, the fintech sector is small in comparison to the size of financially intermediated assets and capital markets, and lags behind in Europe, both in level and growth rate, compared to the US or China. In the European Union (EU), only the UK has a significant

50. IESE Business School.

51. This article draws partially on Sections 2.2.1 and 4.1.5 of Vives (2016). I am grateful to Hugo Ferradans for excellent research assistance.

52. According to the Financial Stability Board fintech is defined as 'technologically enabled financial innovation that could result in new business models, applications, processes or products with an associated material effect on financial markets and institutions and the provision of financial services'. See <http://www.fsb.org/what-we-do/policy-development/additional-policy-areas/monitoring-of-fintech/>

53. For an overview of several aspects of fintech and its evolution see Demertzis et al. (2017), EBA (2017), EY (2017), KPMG (2017), and IMF (2017).

development. Even the largest fintech market, in China, is of marginal size compared to the overall country financial intermediation. In the EU, much of fintech is concentrated in the United Kingdom. Furthermore, fintech in Europe tends to be based domestically and with very limited cross-border flows. This is in contrast to the US and China where new entrants can develop the economies of scale of serving a large market.

With the generation of new business models based on the use of big data, fintech has the potential to disrupt established financial intermediaries and banks in particular. Big data can be treated with algorithms from artificial intelligence (AI), profiting from advanced computing power (including cloud computing, mobile storage through the cloud, and mobile hardware, which allows continuous accessibility). Machine learning is a variant of AI that allows computers to learn without an explicit program; “deep learning” refers to the attempt to derive meaning from big data using layers of learning algorithms. The result of the application of the new techniques could be lower costs of financial intermediation and improved products for consumers. For example, fintech facilities may help to better assess the creditworthiness of loan applicants when an institution screens them, and improve the interface between financial clients and their service providers. Take as an example the mortgage market in the US where the market share of shadow banks (that is, non-bank lenders) has almost tripled in the period 2007-2015. At the end of the period, fintech firms accounted for close to a third of shadow bank loan originations. Buchak et al. (2017) estimate that the increased regulatory burden on traditional banks (in terms also of raised capital requirements and legal scrutiny) explains about 55% of shadow bank growth in the period but that 35% of this dynamic is explained by the use of financial technology. Indeed, it is found that the online origination technology allows fintech outlets to provide more convenience for their borrowers and that they command an interest rate premium among the borrowers that value more this convenience. Fintech firms better screen potential borrowers using improved statistical models based on big data and are more capable to price mortgage risk and price discriminate. They can do so by combining existing data or by using other dimensions of data that traditional banks cannot access. The authors find that interest rates charged explain more of the variation in prepayment outcomes across borrowers for loans of fintech firms than for those of non-fintech intermediaries.

1. The fintech business and efficiency

The main developments in the application of digital technology have occurred so far in lending, payment systems, financial advising, and insurance. In all those segments of business fintech has the potential to lower the cost of intermediation and broaden the access to finance increasing financial inclusion (that is, is fintech could be a door for unserved parts of the population and for less developed countries). One of the reasons for this efficiency-enhancing role lies in the potential to help overcome information asymmetries, which are at the root of the banking business. At the same time fintech firms have no legacy technologies to deal with and a culture of efficient operational design. This leads them to have a larger innovating capacity than traditional entities.

Peer-to-peer (P2P) lending platforms provide credits without bank intermediation where individuals and companies invest in small business. Those platforms match borrowers and lenders directly: some allow the lenders to choose the borrowers; in others they form packages of loans, and online auctions are often used. These platforms frequently provide risk rankings of the business obtained by algorithms to screen borrowers using big data. From a modest base, P2P lending is growing fast in the United States (with LendingClub and Prosper as leaders), and in the UK (with Zopa as an example). Other leading European countries for P2P consumer lending are Germany, France, and Finland. P2P business lending is prominent in China, but its role is limited in the EU. Crowd-funding platforms have increased significantly in EU countries, with France, the Netherlands, Italy, and Germany taking the lead.

Banks, as well as Visa and MasterCard, still dominate the market for transaction payments, but payment innovations often come from nonbanks such as PayPal, Apple, or Google. It is worth noting that mobile-based payment schemes have a great impact in countries where the share of people owning a current account at a bank is small. For instance, countries in Africa where only one in four people has a bank account but, according to *The Economist*,⁵⁴ many more have access to a mobile phone, they are becoming testing grounds for new payment systems as well as for loans for consumers with little credit history.

54. See *The Economist* (2015).

Traditional payment systems may also be disrupted by digital currencies such as Bitcoin. In those currency systems, or cryptocurrencies, encryption techniques regulate the generation of currency units using *blockchain* technology. This technology consists of a public digital database in which transactions can be verified with a system of blocks of records in a decentralized way. It allows value to be transferred peer-to-peer without any intermediary to verify the transaction, with a large number of computers authenticating each transaction sequentially. Blockchain technology is potentially disruptive since it opens the gate to many potential cost-saving innovations. It also permits a currency without the backing of government or a trusted go-between, an intermediation function at which banks have specialized.

“Robo-advisors,” computer programs that generate investment advice according to information they have about customers, and using machine-learning tools, are a cheap alternative to human wealth advisors. Furthermore, if programmed properly, robo-advisors may avoid some of the usual conflicts of interest that plague the sector. Robo-advising is still very incipient and small in relation to overall financial advising, particularly in Europe where assets under management amount to less than 6% of those in the United States.

2. The impact of fintech on banking market structure

Fintech competitors are encroaching on the traditional business of banks, despite the fact that banks are adapting to the digital world. New competitors are able to use hard (codifiable) information to erode the traditional relationship between bank and customer, based on soft information (the knowledge gained from bank and customer relationships). However, most new competitors stay clear of asking for a banking license in order to avoid compliance costs, and try to skim profitable business from banks. A potential advantage of the new entrants lies in exploiting the mistrust towards banks that millennials have developed at the same time that they offer digital services with which the younger generation is at ease.⁵⁵

Banks have traditionally focused on products, while new entrants are more

55. See Deloitte (2016).

focused on customers. Fintech competitors are putting pressure on the traditional business model of banks. Two competitive advantages of retail banks which may be eroded by the new entrants are that (1) banks can borrow cheaply with their access to cheap deposits and explicit or implicit insurance by the government, and (2) they enjoy privileged access to a stable customer base that can be sold a range of products. The presence of deposit insurance may facilitate the entry of new competitors as banks, but in this case the entrants will have to pay the cost of the banking license and compliance expenditures. In the mortgage market in the US, Buchak et al. (2017) find that traditional banks have a somewhat lower shadow cost of funding and that provide higher quality products than shadow banks (but still they lose market share because of their increased regulatory burden). Fintech outlets profit from the situation but rely on both explicit and implicit government guarantees. This fact points out that entry in the intermediation business with new technologies will depend very much on how regulation and government guarantees are applied.

True disruption may come from the full-scale entry of top digital internet companies. Indeed, companies such as Amazon, Apple, or Google are already active in fintech, but have not entered the market in a resolute way. Their potential is very large, however, because they have access to massive amounts of customer data and they may control the interface with them when it comes to financial services. They are growing quickly in payment services, with close to 150 million users in the first semester of 2017. Amazon lending has been growing steadily since its launch in 2011. Even social media platforms may cross-sell financial services profiting on their knowledge of the characteristics of their users.

3. The strategies of the players

An open question from the previous analysis is to what extent the use of information technology and electronic banking (Internet, mobile) and the emergence of fintech competitors makes retail banking more contestable. Two considerations are in order. First, the lighter regulation of fintech providers will have an important bearing on the competition between banks and the new entrants such as payment systems providers or crowd-funding platforms.

However, conduct of business regulation may impair the access of new entrants to the infrastructure run by incumbent banks (for example, third-party payment providers may face obstacles because of lack of protection of customer's data). Second, electronic banking is subject to exogenous and endogenous frictions/switching costs. For example, institutions may undermine the effectiveness of Internet search facilities with obfuscation strategies that increase frictions and restore margins. In general, the enhanced price transparency brought by digital technology may have ambiguous dynamic pricing effects.

The strategies for new entrants and those of incumbent banks will depend on whether investment makes a firm tough or soft in the competition and on whether competition in the market place involves strategic substitutes or complements (that is, whether an increase in the action of a rival induces a decrease or increase, respectively, in the action of the firm). Thus, depending on the underlying industry characteristics an incumbent may decide to accommodate or prevent entry. For example, in the presence of switching costs an established incumbent bank, which cannot discriminate between old and new customers, will behave as a peaceful "fat cat" because it wants to protect the profitability of its large customer base. This may allow an entrant to enter and attract, for example, technology-savvy customers or even unbanked consumers. On occasion, the entrant may want to commit to remain small so as not to elicit an aggressive response from the incumbent. Peer-to-peer lending platforms may provide an example of small-scale entry since they cater in part to unbanked segments of the population. Those platforms, as we have seen, use information available in social networks that alleviate adverse selection and moral hazard problems. A related strategy for an entrant is to form a partnership with the incumbent or for the incumbent bank to co-opt the new competitor. One of the reasons for the partnership interest of the incumbents may be regulatory arbitrage, given the lighter regulation of the new entrants. A rarer case is the entry of new (licensed) banks. The reason is that the setup cost and recurrent fixed costs of operation, including compliance costs, are high. On other occasions, the incumbent may want to prevent or foreclose entry. For example, new entrants may have to rely on the payment infrastructure of the incumbent bank to offer complementary or differentiated services. The incumbent may have incentives to raise the costs of entrants:

one possible way is to degrade the interconnection with the incumbent's infrastructure. This is similar to the incentives to limit compatibility by large banks in ATM networks.

The incumbents may use also bundling and tying strategies to compete. A stylized representation would have an incumbent present in adjacent market segments—A and B—with the incumbent having substantial market power in A (say current account and mortgages) and facing competition in B (say credit cards and insurance). The bank may either integrate those activities or try to leverage its market power in segment A by tying product B. This makes sense only under certain conditions. It does not when the goods are independent and B is produced competitively at constant returns to scale (this is the classical Chicago doctrine). Tying may serve as a deterrence strategy or as an accommodating strategy. As a deterrence strategy, it increases the aggressiveness of the incumbent and makes life for the entrants more difficult, since the entrant has to succeed in both markets. Tying makes sense to foreclose entry when it is irreversible and A and B are not very complementary, since then the incumbent is more aggressive; when there are cost links between markets, or when entry in B is uncertain since then tying makes entry more costly and uncertain since the entrant has to succeed in both complementary markets. As an accommodating strategy, it may serve as a price discrimination device among heterogeneous customers. Typically, tying by the incumbent will decrease the incentives to innovate by the rival but increase those of the incumbent. It is worth noting that innovations in payments systems are primarily generated by nonbanks like PayPal, Google, and Apple. Banks may prefer accommodation of entry because they gain interchange fees paid to them by new service operators and because the cut in revenues to banks for each purchase may be more than compensated by the increase in aggregate transactions performed by customers.

In summary, the incumbents may partner with the new entrants, buy them up partially or totally, or decide to fight them. The details of each segment of the market will matter for the decision as well as the extent of legacy technologies in each institution. Indeed, the response of institutions is likely to be heterogeneous according to their specificity. The new entrants may decide to do so at a small scale and grow from there or, in particular, the Internet giants may attempt large-scale entry by controlling the interface with customers.

4. Regulation and financial stability

First of all, let us note that digital technologies can also be applied to solve regulatory and compliance requirements more efficiently. This is known as “RegTech.”⁵⁶

The challenge for regulation is how to keep a level playing field between incumbents and new entrants so that innovation is promoted, and financial stability is preserved. New fintech entrants should not become the new shadow banking, outside the regulatory perimeter, that contributed so decisively to the 2007-2009 financial crisis by hiding systemic risk under the rug. One issue to monitor according to the Financial Stability Board (2017) is the enhanced prospect for systemic problems arising out of operational risk and cyber risk with fintech activities. However, fintech startups may be able to work with less leverage than traditional banks.⁵⁷ At the same time, the growth of shadow banking (helped by fintech) in mortgages in the US post crisis has relied on the guarantees provided by government sponsored enterprises (GSE) since those shadow banks unload the loans they originate onto the GSE. We see therefore the reliance on government guarantees also in the new non-bank entrants.

The outcome is that to maintain a level playing field between incumbents and entrants will not be easy since a light regulation of fintech to encourage entry, to balance the build-in funding and “too-big-to-fail” advantages of incumbents, should account for the risk of developing a new shadow banking system that increases systemic risk.

The European approach is to have the same rules and supervision for the same services independently of who is providing them.⁵⁸ However, current regulation and supervision is geared towards institutions rather than products and services. One reason is that institutions may fail, generating systemic problems. The present tendency to regulate new services provided by fintech is to offer a “regulatory sandbox” in order for fintech firms to experiment

56. ‘RegTech’ is defined by the Institute of International Finance as ‘the use of new technologies to solve regulatory and compliance requirements more effectively and efficiently.’ It is also described as ‘a subset of FinTech that focuses on technologies that may facilitate the delivery of regulatory requirements more efficiently and effectively than existing capabilities.’

57. See Philippon (2016).

58. See Demertzis et al. (2017) and EBA (2017).

without the heavy regulation of the banking sector and for regulators to discover the best way to keep the activities safe. Consumer protection issues, in particular with regard to data privacy and cybersecurity, raise to the forefront. The tendency is to give customers more control of their data. This can be seen in the Payments Services Directive II (PSD II) and the General Data Protection Regulation in the EU, initiatives such as Open Banking in the UK, and the emergence of commercial banking aggregator models in the US.

In summary, fintech has a large and potentially welfare-enhancing disruptive capability. However, in order for the new technology to deliver the benefits for consumers and firms without endangering financial stability, regulation needs to rise to the challenge.

References:

- Buchak, G., Matvos, G., Piskorski, T., and Seru, A. (2017). Fintech, Regulatory Arbitrage and the Rise of Shadow Banks. NBER Working Paper 23288.
- Demertzis, M., Merler, S., and Wolff, G. (2017). Capital Markets Union and the Fintech Opportunity. Bruegel Policy Contribution 22.
- Deloitte (2016). Millennials and wealth management – Trends and challenges of the new clientele, available at: <https://www2.deloitte.com/content/dam/Deloitte/lu/Documents/financial-services/lu-millennials-wealth-management-trends-challenges-new-clientele-0106205.pdf>
- EBA (2017). EBA's Approach to Financial Technology (FinTech). EBA Discussion Paper DP/2017/02.
- EY (2017). EY Fintech Adoption Index 2017: The Rapid Emergence of FinTech, available at: <http://www.ey.com/gl/en/industries/financial-services/ey-fintech-adoption-index>
- Financial Stability Board (2017). Financial Stability Implications from FinTech, available at: <http://www.fsb.org/2017/06/financial-stability-implications-from-fintech/>
- IMF (2017). Fintech and Financial Services: Initial Considerations, available at: <file:///Users/hugoferradansramonde/Downloads/sdn1705.pdf>
- KPMG (2017). The Pulse of Fintech, available at: <https://assets.kpmg.com/content/dam/kpmg/xx/pdf/2017/07/pulse-of-fintech-q2-2017.pdf>
- Philippon, T. (2016). The Fintech Opportunity. NBER working paper 22476.
- The Economist (2015). The Bank in your Pocket, May 9, 2015.
- Vives, X. (2016). Competition and Stability in Banking. Princeton University Press.

The Big Promise of Fintech

by Marcello Bofondi and Giorgio Gobbi⁵⁹

Abstract

Fintech is introducing in the financial landscape new products, new business models, new players. In this paper we elaborate on the relationship between Fintech and banks, bearing in mind that in the past innovation triggered widespread financial instability. We argue that Fintech represents a serious challenge for the traditional banking business model. However, we build on the evidence on the development of shadow banking to caution against early predictions of an irreparable decline of banking institutions. We conclude that a flexible, pragmatic and open minded approach to Fintech regulation is the second best in a world of huge uncertainty about technology and consumer preferences.

1. Introduction

It is difficult these days to find a cooler topic than Fintech in the broad world of finance. Typing “Fintech”, the most popular web search engine returns more than 30 million results. Half of the returns are related to Fintech

59. Banca d'Italia, Regulation and Macropprudential Analysis Directorate and Financial Stability Directorate, respectively. The usual disclaimers apply, and in particular the views expressed do not necessarily represent those of the Banca d'Italia.

start-ups, witnessing the burgeoning activity going on in the grassland of the financial industry. Policy makers, regulators, supervisors and international institutions have taken full notice of it and are beginning to explore the new environment. The number of official reports and consultation papers is rapidly increasing, but more interestingly, digital technologies are also potentially reshaping regulation (regtech) and supervision (supetch) of financial activities. Finally, the academia is responding with conferences and journal special issues focused on research about Fintech.

Fintech covers a broad area of activities and businesses ranging from the development of new technologies to the commercialization of financial services. From a financial policy perspective, the Financial Stability Board (Financial Stability Board, 2017) organizes Fintech activities in five broad categories: (i) payments, clearing and settlement; (ii) deposit, lending and capital raising; (iii) insurance; (iv) investment management; and (v) market support. These five classes cover virtually all the spectrum of services provided by traditional financial institutions. New Fintech companies are threatening market shares and profit margins of the incumbents in virtually all business areas.

The financial industry, and especially the banking sector, is heavily regulated because of its role as a key infrastructure of market economies. Disruptions in the supply of financial services may have huge consequences in terms of welfare losses as witnessed by the long history of financial crises, the last episode of the series being the global financial crisis of the past decade. In many circumstances financial innovation triggers widespread instability, which is why in academic research the balance between costs and benefits of competition in the industry is still an open issue (Thakor, 2011). Reaching an early understanding of transformations in the financial landscape induced by Fintech is then substantial to an efficient evolution of the regulatory framework. Furthermore, since most of the current regulation is institution-oriented rather activity-oriented, it is also crucial to assess how the new entrant Fintech firms fit into the framework and how the incumbent institutions react.

In this paper we elaborate on the relationship between Fintech and banks. First, we argue that Fintech represents a serious challenge for the traditional banking business model because of the “[d]isaggregation of the value chain

[that] could follow from online platform becoming the preferred customer interface” (Boot, 2016). Second, we build on the evidence on the development of shadow banking to caution against early predictions of an irreparable decline of banking institutions. Last, we conclude that a flexible, pragmatic and open minded approach to Fintech regulation is the second best in a world of huge uncertainty about technology and consumer preferences.

2. ICT in banking

Progress in Information and Communication Technology (ICT) began several decades ago, and the financial industry has historically been at the forefront in its adoption. Under the pressure of competition, the efficiency gains stemming from innovation should have been transferred to customers, leaving little room for new entrants. Philippon (2016), however, shows that, in spite of the advances in ICT, the unit cost of financial services for the end users has not changed significantly over the past 130 years: efficiency gains have been reaped by incumbent banks and other intermediaries.

As in several other industries (Brynjolfsson and McAfee, 2014), the more recent developments in ICT may have radically improved the chances for Fintech firms to successfully enter the financial sector. These changes affect the economics of the technological space along three dimensions: i) data storage and processing, ii) data transfer, and iii) data availability. Cloud computing allows large amounts of information to be stored and processed, using on demand computers with a high level of computational capacity without incurring in huge fixed costs. The Internet allows data to be transferred in bulk without the need for costly dedicated networks. The digitalization of society and economy produces an enormous amount of valuable information (big data). Fintech firms are leveraging these changes to provide services that have historically been the bread and butter of commercial banks, and a large source of their earnings.

So far, banks have taken advantage of their quasi-monopoly in the deposit market. Deposits are often the first way households and firms start their relationship with the financial industry. Presenting themselves as a one-stop-shop, banks offer their customers other services, typically more profitable than

deposits. Moreover, the higher the number of products a customer buys, the higher the costs to switch to competitors are likely to be, granting the incumbent bank oligopoly power and further profits. High switching costs also make it less compelling to invest in innovation that improves the customer's experience.

Fintech firms are using technological innovation to take advantage of these features of banks' business model, trying to leave to banks the business of low value-added products while stealing the oligopoly profits deriving from the sale of other services. Switching costs are lowered through the intensive use of remote distribution channels. Client acquisition is also fostered by an extremely close attention to customers' needs, particularly of those born in the 1970s and '80s, who place a high value on accessibility, speed, and user-friendliness.

Banks' margins are attacked from all sides: the Fintech ecosystem is populated by firms offering basically all kinds of financial services. Income from payment services is challenged by firms like Apple, Google, and PayPal. Fees from wealth management are threatened by robo-advisors that offer online financial advice and portfolio management mainly through automated algorithms. Peer-to-peer lenders have the potential to erode origination, servicing and interest rate income by disintermediating loans to households and small and medium enterprises. In a more futuristic scenario, virtual currencies may menace the last stronghold of banks: the creation of private money.

Is the threat to banks' profitability posed by Fintech firms real? Venture capitalists seem to believe that these challengers actually have the potential to create value: from 2010 to 2015 the amount of equity financing to the Fintech space increased from 2 to 22 billion dollars (Accenture, 2016).

A strictly related question refers to the viability of banks as traditional financial firms. McAfee and Brynjolfsson (2017) quote strategist Tom Goodwin pointing out a pattern: "Uber, the world's largest taxi company, owns no vehicles. Facebook, the world's most popular media owner, crates no content. Alibaba, the most valuable retailer, has no inventory. And Airbnb, the world's largest accommodation provider, owns no real estate." By extrapolating, can we envisage in a not so far future the world's largest provider of banking services with a very thin balance sheet? This bring back to the time-honoured academic question of why financial intermediaries like banks do exist. The

now standard textbook answer is that financial intermediaries arise because of scale and scope economies in solving or reducing market imperfections (e.g. Buckle and Beccalli, 2011) mostly connected with asymmetric information. Potentially, digital technologies can abate the market imperfections at the origin of the comparative advantage of intermediaries over markets.

Goldfarb and Tucker (2017) identify five types of economic costs that are abated by digital technologies: (i) search costs; (ii) replication costs; (iii) transportation costs; (iv) tracking costs; (v) verification costs. It is not difficult to map each of these types onto specific financial activities. For instance, banks have developed internal technologies to deal with the costs of matching fund savers and end users' preferences in terms of risk, maturity, liquidity etc., with those of information tracking and verification. Transportation costs have originated a particular (profitable) form of bank intermediation, i.e. relationships lending. The big promise of Fintech is to build on the potential cost-cutting allowed by digital technologies to dramatically reduce financial frictions. Even in the short run, the resulting gains appear substantial. The FSB enumerate some of them relying on market insiders information (Capgemini Consulting): "For instance estimates suggest that mortgage borrowers in the US and European markets could potentially save \$480 to \$960 per loan and banks would be able to reduce costs in the range of \$3 billion to \$ 11 billion annually by lowering processing costs in the mortgage origination process." (Financial Stability Board, 2017, p. 10).

There are two diametrically opposed ways in which Fintech can deliver its big promise. One is leaving the existing financial industry broadly unchanged: incumbents will adopt the new digital technologies and competition will drive down cost reductions to the consumers, with little disintermediation occurring. The other, on the opposite, is a financial landscape dominated by "thin layer" financial firms (platforms): "Because they're so thin – because they own mainly applications and code and not physical assets and infrastructure – they could grow rapidly" (McAfee and Brynjolfsson, 2017, p. 9). Most likely in the near future both (evolved) traditional financial intermediaries and new platform will coexist and compete.

Banks are actively responding to the threat posed by Fintech firms, although they are somewhat slowed down by old and complex IT systems that

are not designed to take advantage of the more recent advances in technology. In some cases, banks are trying to replicate Fintech models, such as by setting up online lending platforms. Other intermediaries are partnering with the new entrants, externalizing part of their production processes to exploit Fintech firms' greater efficiency. Many banks consider the adoption of new technologies a strategic priority. The most likely scenario is that margins will shrink and some of the products now offered by banks will also be provided by other firms.

But is this big promise to be trusted? The large amount of information processed by digital technologies may be used to open markets and squeeze price to marginal costs or to sophisticated price discrimination strategies (Shapiro and Varian, 1998). An extremely interesting case in point is provided by the residential mortgage market in the US. Buchak et al. (2017) document a huge increase in the market share of shadow banks from 2007 to 2015 (from 14 to 38 per cent) partly driven by regulatory arbitrage and partly by financial technology. Over the same period Fintech lenders have increased their market share from 5 to 15 per cent. Compared with the other shadow banks, namely within the same regulatory framework, the Fintech lenders present two distinguishing characteristics. First, Fintech firms ex-ante charge interest rates more closely related to loan ex-post performance than other (shadow) lenders. The evidence is consistent with the use of big data technique in the process of risk evaluation. The second characteristics pertains to price behaviour. Fintech lenders charge lower margins for the least creditworthy borrowers and higher for the most creditworthy borrowers. They appear to be able to appropriate part of the consumer surplus "generated" by the convenience of online transactions.

Summing up, digital technologies are potentially disruptive of the industrial organisation of the financial industry because they impact on the market frictions that give a comparative advantage to intermediaries like banks. The promise of cost saving to be translated to consumers is huge. There is however large uncertainty on who will deliver the promise and how. Finally, if on the one hand digital technologies open traditional markets to the competition of new entrants, on the other they also offer unprecedented tools for customising product and services and extracting consumer surplus through price discrimination.

3. Once again: Are banks dead or is the report greatly exaggerated?

Incumbents in the financial industry, and banks in particular, face recurrent challenges from outsiders. The one posed by Fintech firms is probably new in terms of its broadness and disruptiveness. All lines of businesses appear to be under threat and the innovation is not just in the provision of single products and services, but in the way in which financial services are produced, delivered and consumed. Most importantly, the development of digital technologies in the financial industry is fully integrated with the broader digitalization of economy and society at large. However, one should be prudent before announcing that this time is really different. Lessons from the past, if interpreted judiciously, may help to read some of the changes in the pipeline.

The big promise of Fintech is to open the financial and banking sector to the driving force of innovation and efficiency. But efficiency has often been in conflict with stability. Trying to enhance resilience, governments granted banks – i.e. the core institutions of any financial system – public insurance, both on credit (through deposit insurance) and on liquidity (lender of last resort). This, however, is not sufficient to ensure either stability or efficiency. Since public insurance is difficult to price, it generates moral hazard that may eventually lead to excessive risk-taking. In return for insurance, therefore, banking systems are heavily regulated. The literature on industrial organization teaches us that tightly regulated markets tend also to be highly inefficient. Policy makers' attempts to strike the right balance between efficiency and stability have been a major driver in shaping the financial industry over the last 100 years.

Financial crises have marked turning points in the regulatory stance. Following the crisis of the 1930s, the quest for stability induced policy makers to shelter the banking industry from competition, thus isolating it from innovation. In Europe and many other jurisdictions, large sections of the banking sector were directly or indirectly placed under public control.

In the 1980s, consensus on the priority given to stability began to weaken. The new regulation paradigm was to lift barriers to entry and any norms protecting banks from competition, while discouraging risk-taking by means of capital requirements (Claessens, 2016). This process culminated in 1988 with the first Basel Capital Accord, which was implemented by the ten largest

market economies by 1992. In Europe, deregulation was part of the larger project to create a single European market. The purpose of the First and Second European Banking Directives (enacted in 1977 and 1992) was to enhance capital allocation across the Continent by levelling the playing field through regulatory convergence. National banking markets, once strongly protected from foreign competition, became gradually more susceptible to challenge. In the US, the change in the regulatory framework was driven not only by considerations of efficiency but also by financial innovation (Wall, 2014). The expansion of money market funds in the early 1980s that threatened banks' deposit base eventually led to the removal of interest rate ceilings on deposits (Berger et al., 1995). Banks avoided large deposit outflows, but their margins shrank. On both sides of the Pond banks' profitability was at risk.

The adjustment to the new paradigm was not straightforward and life grew difficult for the banks. In some countries they responded with excessive risk-taking, which ended in systemic, though not too painful, crises. In the US the idea that banks were in deep trouble and that they would become irrelevant became mainstream. In 1993 William Isaac, former president of the Deposit Insurance Corporation, said that 'the banking industry is becoming irrelevant economically, and it's almost irrelevant politically' (Bacon, 1993). In the same year Carter Golembe, a leading consultant of the American banking industry at the time, highlighted that 'the major problems faced by the banking industry [are], most notably, its eroding competitive position in the financial community and the crushing burden of regulation' (Golembe 1993).

However, paraphrasing the title of a famous paper, the banks were not dead yet: the reports were greatly exaggerated. Boyd and Gertler (1995) showed that the apparent decline of commercial banks was mainly due to mismeasurement, in particular to the habit of computing the weight of commercial banks in the financial system by considering their total assets. Once off-balance-sheet items (such as loans sold to other intermediaries, credit commitments, and derivatives) were included, the statistics indicated that commercial banks were actually alive and thriving. They were just adapting to the new environment.

The findings of Boyd and Gertler were the prelude to the events of the following decade: to sustain their profitability banks changed their business model. In Europe, where deregulation allowed them to adopt the universal bank model, banks expanded their activities (Pagano et al., 2014). A wave of mergers

and acquisitions profoundly changed the structure of the banking system as European intermediaries sought to sustain their profitability by exploiting scope and scale economies. The universal bank model, once confined to a few countries, became pervasive and the share of customer loans over total assets declined significantly. Banks increased loans to other financial intermediaries and their proprietary trading. Off-balance-sheet activities such as derivatives, asset management, and underwriting became increasingly important.

In the US, where the separation between commercial and investment activities was maintained, commercial banks increasingly shifted their business out of the balance sheet, as far as possible from the regulators' eyes. The morphology of the US financial system changed dramatically: an unregulated shadow banking system emerged and banks became its most important service providers (Cetorelli et al., 2012). The shadow banking model of financial intermediation was characterized by a long credit intermediation chain that involved a multitude of agents (Pozsar et al., 2010). Banks issued deposits to shadow banks, secured with the senior tranches of the securities produced by the shadow banking system that were in part backed by sub-prime loans (Gorton, 2010). On top of this, banks' ability to provide liquidity was reinforced by their (insured) customer deposit base and by their eligibility as monetary policy counterparties. This mechanism worked smoothly until the quality of the securities backing the shadow banking system deposits was questioned.

We draw two lessons from these stylized facts. The first one is that the incumbents, i.e. the banks, have proven to be extremely resilient in different regulatory and economic environments, such as those prevailing in the US and in Europe. They have leveraged on a few comparative advantages - their key role in the origination and distribution of liquidity in the economy being the most important, but not the only one - to fend off the competition of new entrants or to develop new lines of business. Digital technologies are likely to dent the comparative advantages of the past but others could turn out to be crucial. The academic research on those industries that are more mature in terms of digitalization provides some useful insights. One relevant strand of research relates to a question similar to the one posed by Boyd and Gertler: "Is distance dead?". The results of the vast literature reviewed by Goldfarb and Tucker (2017) point out that, albeit distance matters less than in the past, it is not in fact dead. In several industries online sales are substitutes for offline

sales, but in others the relationship is rather one of complementarity. Even more relevant are the findings that “trust is easier locally”, namely the importance of known people even for online transactions. The presently oversized branch networks of many European banks, once restructured, might prove in the end a forceful competitive driver.

The second lesson drawn from history is that the incumbents’ reaction to the challenges posed by outsiders may be detrimental to the other main objective of financial policy: stability. The global financial crisis and the great recession are partly due to a mismatch between changes in financial markets and in the activities of banks and other financial institutions and the regulatory framework.

4. Risks and regulation

Fintech is introducing in the financial landscape new products, new business models, new players. Part of the intermediation chain and of the payment system is moving outside the traditional financial ecosystem. Incumbents are feeling the pressure of these changes, trying to adapt to the new environment. The potential for efficiency gains, increased accessibility to financial services and lower end-user costs are great, but great opportunities always come with great risks and safeguarding against risks without curbing innovation in a rapidly changing landscape is the challenge that regulators will face in the near future.

There is actually not very much new under the sun. The ‘traditional’ sources of both micro and macro financial risks – excessive credit growth and leverage, excessive maturity and liquidity mismatch, direct and indirect exposure concentrations, bad governance, misaligned incentives, vulnerabilities of the IT infrastructures – are always the same. However, some of them may be amplified by the spread of Fintech (FSB, 2017). In particular operational risk may increase as financial institutions and markets increasingly rely on a few third parties as providers of services such as cloud data storage or telecommunications. Moreover, vulnerability to cyber-attacks is greater the larger is the range and number of entry points that may be targeted and the consequences are more severe the more the systems of

different institutions are connected. Given the possible role of technology as financial shock amplifier, financial regulators will be called to strictly cooperate with the authorities responsible for IT safety and security.

Identifying and monitoring risks, however, is only the first and maybe easier job of regulators. The next and far more challenging step is to design the rules and define the regulatory perimeter. Regulators and supervisors have great experience, partly gained at the hard cost of painful crises, in dealing with banks and markets. However, they are still in the process of building their ability to cope with the shadow banking system, of which Fintech firms are the most dynamic part. Existing rules have been designed to regulate traditional activities and intermediaries and, given the speed of transformation of the Fintech landscape, it is often difficult to understand how, when, and to which agents they can be applied. However, specific rules for Fintech firms may not be effective, since they perform a broad range of activities (Panetta, 2017).

The temptation to over-regulate, minimizing the risks at the expenses of innovation, may be great. This, however, would not only be against the public interest, but also probably impossible, given the liquid nature of innovation. What regulators may reasonably do is to adopt a pragmatic approach that should be flexible, coordinated across jurisdictions and based on a continuous dialogue with the industry as suggested both in FSB (2017). In this spirit a number of national authorities set up innovation hubs, regulatory sandboxes or innovation incubators. The Bank of Italy, for example, recently launched its innovation hub (called 'Fintech Channel') opening a new channel of communication and dialogue with market operators supporting innovation processes in the regulatory arena and adopting a forward-looking approach.

Finally, regulators and supervisors need to invest resources and build skills also to understand how new technologies may be used to pursue their objectives. An increasing number of innovative 'Regtech' firms are offering solutions that help banks and other intermediaries to comply with regulatory requirements and manage risk more effectively and efficiently BCBS (2017). Moreover, supervisors should consider investigating and exploring the potential of new technologies to improve their methods and processes. Big data coming from social media, for instance, may result extremely effective to nowcast inflows and outflows of retail deposits when supervisors are concerned of potential bank runs (Accornero and Moscatelli, 2017).

References

- Accenture (2016). Fintech and the evolving landscape: Landing points for the industry, April.
- Accornero, M., and Moscatelli, M. (2017). Listening to the buzz: Social media sentiment and retail depositors' trust. Bank of Italy, mimeo.
- Bacon, K. H. (1993). Losing ground: Banks' declining role in economy worries Fed, may hurt firms. *Wall Street Journal* (July 9).
- Basel Committee on Banking Supervision (2017). Sound practices: Implication of Fintech developments for banks and bank supervisors. Consultative Document.
- Berger, A.N, Kashyap, A.K., Scalise, J.M., Gertler, M., and Friedman, B.M. (1995). The transformation of the U.S. banking industry: What a long, strange trip it's been. *Brookings Papers on Economic Activity*, 1995 (2), 55-218.
- Boot, A.W.A (2016). Understanding the future of banking scale and scope economies, and Fintech, in Demircug- Kunt, A., Evanoff, D.E., and Kaufman, G.G. (Eds.), *The future of large internationally active banks*. World Scientific Publishing.
- Brynjolfsson, E., and McAfee, A. (2014). *The second machine age: Work, progress, and prosperity in a time of brilliant technologies*. W. W. Norton & Company.
- Brynjolfsson E., and McAfee, A. (2017). *Machine, platform, crowd: Harnessing our digital future*. W. W. Norton & Company.
- Boyd, J.H., and Gertler, M. (1995). Are banks dead? Or are the reports greatly exaggerated? NBER Working Paper, No. 5045.
- Buchak, G., Matvos, G., Pikorski, T., and Seru, A. (2017). Fintech, regulatory arbitrage, and the rise of shadow banking. NBER Working Paper, No. 23288.
- Buckle, M. and Beccalli, E. (2011). *Principles of banking and finance*, London University Press.
- Cetorelli, N., Mandel, B.H., and Mollineaux, L. (2012). The evolution of banks and financial intermediation: Framing the analysis. *Federal Reserve Bank of New York Economic Policy Review*, 18 (2), 1-12.
- Claessens, S. (2016). Regulation and structural change in financial systems. Paper presented at ECB Forum on Central Banks, Sintra 27-29 June 2016. Available at: <https://www.ecbforum.eu/en/content/programme/speakers-and-papers-livre/stijn-claessens.html>
- Financial Stability Board (2017). Financial stability implications from Fintech: supervisory and regulatory issues that merit authorities' attentions. Available at: <http://www.fsb.org/wp-content/uploads/R270617.pdf>
- Goldfarb, A., and Tucker, C. (2017). Digital economics. NBER Working Paper, No. 23684.
- Golembe, C. H. (1993). *Golembe reports*, 7, 2-4.
- Gorton, G. B. (2010). Questions and answers about the financial crisis. NBER Working Paper, No. 15787.
- Pagano M., Langfield, S., Acharya, V., Boot, A., Brunnermeier, M., Buch, C., Hellwig, M., Sapir, A., and van den Burg, I. (2014). Is Europe overbanked? Report No.4, European Systemic Risk Board's Advisory Scientific Committee. Available at: https://www.esrb.europa.eu/pub/pdf/asc/Reports_ASC_4_1406.pdf?5fb1382c5a560f243ecf1989cfd37f4c

Panetta, F. (2017). Fact-finding inquiry on the impact of financial technology on the financial, banking and insurance sectors. Testimony to the Sixth Standing Committee (Finance) - Chamber of Deputies.

Philippon, T. (2016). The FinTech opportunity. NBER Working Paper, No. 22476.

Pozsar, Z., Adrian, T., Ashcraft, A.B., and Boesky, H. (2010). Shadow banking. Federal Reserve Bank of New York Staff Reports, No. 458.

Shapiro, C., and Varian, H.R. (1998). Information rules: A Strategic guide to the network economy. Harvard Business Press.

Thakor, A.V. (2011). Incentives to innovate and financial crises. *Journal of Financial Economics*, 103 (1), 130-148.

Wall, L.D. (2014). Two drivers of financial innovation. Notes from the Vault. Federal Reserve Bank of Atlanta.

Regulating FinTech: Crowdfunding and Beyond

by Guido Ferrarini⁶⁰

Abstract

The challenges posed by FinTech to regulation are similar to those raised by financial innovation in general. The first is to identify those areas of the law dealing with each type of Fintech instrument or institution. The second challenge is to establish whether regulation should be incrementally adapted to the various types of FinTech focussing on their function, or radically reformed by enacting special regimes and/or introducing ad hoc exemptions for FinTechs. In this paper, I consider loan-based crowdfunding and investment-based crowdfunding as meaningful case studies and analyse their regulatory treatment in European jurisdictions, which may be found in different areas – banking, payments, securities or ad hoc regulation - depending on the country considered, the business model adopted, the attitude and relative power of financial supervisors. Moreover, I offer an example of functional approach to crowdfunding policy by suggesting ways in which the two main types of crowdfunding (equity-based and loan-based) could be regulated in Europe along the model of securities regulation. In principle, I shun a holistic attitude to FinTech, as well as claims for radical reform in this area such as those advanced by recent scholarship. I prefer a pragmatic approach to FinTech differentiating the services to which existing regulation can be adapted from those - such as electronic payments and mobile payments - that have attracted special reform promoting competition and transparency in the relevant fields.

60. University of Genoa and University of Nijmegen.

I consider the Payment Service Directives (PSD 1 and 2) as an example of this type of reform. I conclude that new provisions are often motivated by the need to enhance the protection of clients vis-à-vis FinTech institutions and tools. However, they are also aimed to reduce the transaction costs of services through technology and/or to promote financial innovation. The regulation of crowdfunding precisely shows the trade-offs between investor protection and financial innovation/economic growth, while PSD 1 and 2 offer examples of legislation which facilitates the disruption of traditional finance and promotes the competition between incumbent institutions and the new players, including large IT companies, telecoms and thousands of start-ups.

1. Introduction

The challenges posed by FinTech to regulation and regulatory policy are similar to those raised by financial innovation in general, although financial innovation does not always derive from technological breakthroughs (Avgouleas, 2015). The first challenge is to identify those areas of the law dealing with each type of Fintech instrument or institution. In section 2 below, I consider loan-based crowdfunding and investment-based crowdfunding as meaningful case studies, while in section 3 I analyse their regulatory treatment in European jurisdictions, which may be found in different areas – banking, payments, securities or *ad hoc* regulation – depending on the country considered, the business model adopted, the attitude and relative power of financial supervisors.

A second challenge is to establish whether regulation should be incrementally adapted to the various types of FinTech focussing on their function, or radically reformed by enacting special regimes and/or introducing *ad hoc* exemptions for FinTechs, sometimes dubbed as regulatory sandboxes (EBA, 2017, 33; FSB, 2017, 28). In section 4, I offer an example of functional approach to crowdfunding policy by suggesting ways in which its two main types (equity-based and loan-based crowdfunding) could be regulated in Europe along the model of securities regulation. In principle, I shun a holistic attitude to FinTech, as well as claims for radical reform in this area such as those advanced by recent scholarship (e. g. D. Zetzsche, R. Buckley, D. Arner and J. Barberis, Nathan, 2017). I prefer a pragmatic approach to FinTech

differentiating the services to which existing regulation can be adapted from those - such as electronic payments and mobile payments - that have attracted special reform promoting competition and transparency in the relevant fields. I consider the Payment Service Directives (PSD 1 and 2) as an example of this type of reform in section 5. I do not consider other areas of FinTech, such as those enabled by DLT technology, which may require extensive legal reform in the future, for they are still subject to testing and it is presently difficult to envisage policies regarding them (ESMA, 2017, 11).

The policy interventions concerning FinTech will ultimately depend on the goals pursued by governments and politicians, and on the relative weight of the interest groups involved. As I conclude in section 6, new provisions are often motivated by the need to enhance the protection of clients vis-à-vis FinTech institutions and tools. However, they are also aimed to reduce the transaction costs of services through technology and/or to promote financial innovation. The regulation of crowdfunding precisely shows the trade-offs between investor protection and financial innovation/economic growth, while PSD 1 and 2 offer examples of legislation which facilitates the disruption of traditional finance and promotes the competition between incumbent institutions and the new players, including large IT companies, telecoms and thousands of start-ups.

2. FinTech and alternative finance

In this section and the following one, I focus on FinTech as applied to alternative finance with special reference to financial reward (FR) crowdfunding, and show how financial regulation has been either adapted or reformed at national level in order to enhance investor protection while fostering financial innovation.

Alternative finance

The distinctive feature of FinTechs engaged in alternative finance, like P2P lenders, is that they employ digital platforms for connecting those in need of financing with investors and savers willing to take on the relevant risks (G. Ferrarini and E. Macchiavello 2018). Digital platforms are the new instruments for financial disintermediation (or for new forms of

intermediation), for they offer their services directly to existing and potential clients on the web (M. Fenwick, J. McCahery and E. Vermeulen, 2017). The firms running digital platforms generally do not undertake the risks of financial activities that are executed on the same. They rather act like brokers between borrowers and investors, without facing the capital constraints that affect banking activities. In essence, digital platforms are ‘transparent’ intermediaries between borrowers and investors, while banks are ‘opaque’ intermediaries (S. A. Ross, 1989) that extend credits to clients on their own books, while receiving deposits from savers as liabilities.

Digital platforms do not create the stability risks typical of banks, which justify the capital requirements foreseen by banking and investment firms’ regulation. This explains, partially at least, the success of FinTechs operating as alternative lenders after the great financial crisis. While capital requirements for banks and other opaque intermediaries have been tightened as a result of the crisis, alternative lenders are able to operate without similar constraints. Their clients are protected mainly through other means, such as the offer of diversified portfolios for investment and the creation of special guarantee funds. Moreover, the platforms specialise in assessing the credit risk of borrowers and producing scores to the benefit of investors. Banks perform similar tasks to their own benefit. However, digital technology allows firms to collect information, including big data, about recipients of funds in unprecedented ways, which FinTechs are fast to exploit often better than banks. Other reasons for the development of FinTechs in alternative finance obviously include speed of execution and convenience for firms and investors, together with the attractiveness of financial democracy particularly after the crisis.

FR-crowdfunding is a manifestation of marketplace investing, representing a significant part of the Fintech industry. FR-crowdfunding includes either lending transactions, whereby the investors/lenders expect to receive the principal and interest at the end of the lending period, or equity transactions, where a privately-held company offers securities to the general public through the medium of an online platform. The distinction is consequently made between loan-based (LB)-crowdfunding, commonly referred to as peer-to-peer (P2P) lending, and equity crowdfunding or, more generally, investment-based (IB)-crowdfunding, which could also refer to bonds and other debt securities (E. Kirby and S. Worner, 2014).

Marketplace investing also includes other transactions, which do not necessarily involve the crowd. Its key identifier is the digital platform where financial transactions occur between the recipient of funds and investors. The latter access the platform for executing either primary market transactions – such as the granting of a loan or the subscription of a bond – or secondary market transactions (such as the sale of a loan participation or of investment securities). The platform is similar to an exchange and marketplace investing presents similarities with exchange investing (G. Ferrarini and P. Saguato, 2015). However, market participants access the platform directly, i.e. without intermediaries, whereas an intermediary generally runs the platform. Moreover, transactions generally have a bilateral character, being intermediated by the digital platform, whereas exchange trading is by definition multilateral (ESMA, 2014, 18).

FR-crowdfunding

FR-crowdfunding has attracted the attention of regulators due to its relevance and also to the fact that retail investors are involved. Its two forms - LB- and IB-crowdfunding - share some common features. First, they both have a clear investment component, i.e. the expectation of profits from the efforts of others. Second, FR-crowdfunding platforms are a manifestation of direct finance and therefore of disintermediation relative to traditional intermediaries. Nonetheless, platforms play an important role in reducing information asymmetries between recipients and lenders/investors. In fact, the latter either rely on the platform's checks of recipients and other information conveyed through the platform, including rating or scoring of recipients, or on automatic diversification of investments by the platform. In the absence of traditional intermediaries such as banks and of the typical mechanisms of securities markets (including book-building and the aggregation of public information through secondary markets), crowd-lenders/investors would otherwise have difficulties in identifying the correct price, unless we assume that the 'wisdom of the crowd' is working here to the benefit of all (J. Surowiecki, 2004).

There are also relevant differences between the two types of crowdfunding, starting from the products offered: loans and profit-participation loans in LB-crowdfunding; equity/quasi-equity, debt securities (bonds, mini-bonds),

investment funds/securitized debt in IB-crowdfunding. However, the two models appear to converge in practice when complex structures, including the use of SPVs or guarantee funds, and hybrid forms (such as profit-participation loans) make the transactions similar to investments of the quasi-equity type, often with a collective character (FCA, July 2016). Moreover, illiquid debt securities of unlisted companies and illiquid hybrid/quasi-equity products offered by IB-crowdfunding platforms present similarities with LB loans.

Other elements of comparison between IB- and LB-crowdfunding emerge from an analysis of their respective risks and benefits. The two types of crowdfunding present similar benefits to investors. In fact, crowd-lenders and crowd-investors may receive higher returns, diversifications opportunities (investing in an alternative market, often resilient to changes of mainstream markets) and possibly emotional satisfaction from helping people and participating to a project in which they believe (European Commission Financial Services User Group, 2015, 55-6). Furthermore, crowdfunding could enhance financing opportunities for households and SMEs, also thanks to lower transaction costs, and serve as a market test and marketing tool for firms' products. Finally, the system might benefit from increased competition in the financial market (in Europe mostly dominated by banks) and stimulus to innovation (European Commission, 2014, 5).

The two forms of crowdfunding also share some risks. Firstly, crowd-lenders/investors might not be fully aware of the specific risks of their investment especially as a result of cognitive biases and/or of misleading advertisements or unchecked information. They might lose the capital lent/invested as a consequence of the recipient's and/or platform's negligence and the magnitude of the loss could be enhanced by the fact of concentrating investments on a single platform and a few borrowers/issuers. No doubt, equity-based crowdfunding is riskier to investors than LB-crowdfunding. Firstly, few small companies present characteristics making investment in their shares appear as relatively safe and feasible. Moreover, due diligence is more complex and time-consuming, therefore limiting the number of campaigns simultaneously present on the platform (European Commission Financial Services User Group, 2015). Secondly, the universe of investible companies is limited, so that diversification of investments is more difficult than in LB-crowdfunding. Thirdly, lock-in periods may be longer than average

loan maturity and the investees, generally start-ups and seed companies, are generally riskier than other companies and typically attract venture capitalists who factor-in a high percentage of defaults (FCA, 2013). As a result, crowd-investors tend to attach particular importance to information made available by the platform in taking their investment decisions, while LB-crowdfunding models are moving also in Europe towards forms of automatic matching ('auto-bid') (Kathryn Judge, 2015).

3. Regulatory approaches to crowdfunding

National approaches to FR-crowdfunding vary substantially among member States (G. Ferrarini and E. Macchiavello, 2018). We can distinguish between a 'traditional' approach extending prior banking or financial regulation to FR-crowdfunding and a 'innovative' one consisting of the adoption of either *ad hoc* rules or fully-fledged regimes for FR-crowdfunding. However, relevant differences exist even amongst countries adopting the same approach.

Loan-based crowdfunding

In Europe, platforms generally do not lend money directly, but only facilitate loans amongst their clients. Nonetheless, in some business models either the platform takes a participation in the loans made through it or a bank extends the loans on behalf of crowd-lenders (European Commission, 2016, 33). In other models, the platform either issues notes to crowd-investors that are backed by loan originally made by a bank (the prevailing model in the U.S.) or assigns investors the right to a return calculated on the performance of either individual loans or of a pool of loans.

These activities can in principle trigger the application of a number of laws and regulations concerning different areas (such as banking, payments, financial services and markets, consumer protection, anti-money laundering-AML). However, different business models and different legal traditions determine substantial differences between the regimes applicable to LB-crowdfunding platforms around the world.

(a) Under a first approach, LB-crowdfunding is seen as falling under banking law. In the case of *Zopa Italia*, for instance, the Bank of Italy as a

banking supervisor held that the receipt of funds by a P2P platform, in view of transferring the same from lenders to borrowers, gave rise to the receipt of repayable funds from the public, as such prohibited to undertakings other than banks under Italian banking law (E. Macchiavello, 2015). This type of breach of the banking monopoly could be found in cases of imperfect separation of the funds of clients from those of the platform determining an obligation of the latter to repay the relevant amount of money, as well as in cases where clients are entitled to choose between reimbursement of the funds and re-investment of the same in the system (*de facto* a form of deposit).

However, from a policy perspective, prudential regulation has been designed for banking firms, which undertake the risk of lending money collected from the public through deposits. Banks also transform maturities and have a special role in liquidity formation, transmission of monetary policy and payment systems. Extending the banking regime to crowdfunding platforms, which do not lend money at their own risk and formally do not accept deposits, appears to be overreaching and unjustified. LB-crowdfunding would rather require specific measures tailored to its peculiar features and risks (e.g. special warnings to crowd-investors as to the risks undertaken by the same).

(b) Under a second approach, national authorities (including the Bank of Italy) and EBA consider crowdfunding activities as subject to payment services regulation, based on the argument that these activities might include the execution of payments on behalf of lenders and borrowers on the platform (EBA, 2015). Another reason for preferring this type of regulation and asking platforms to apply for authorization as payment institutions can be found in the special treatment of money held by these institutions on behalf of their clients. In fact, the funds received by payment institutions from payment service users with a view to the provision of payment services do not constitute a deposit or other repayable funds within the meaning of CRD IV.⁶¹ Moreover, the relevant regime ensures money segregation, continuity of payments and cyber security provisions. Nonetheless, the regulation of payment services does not satisfy the

61. See Article 18 of Directive (EU) 2015/2036 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market (PSD 2) stating: '[...](2) Where payment institutions engage in the provision of one or more payment services, they may hold only payment accounts which are used exclusively for payment transactions. (3) Any funds received by payment institutions from payment service users with a view to the provision of payment services shall not constitute a deposit or other repayable funds within the meaning of Article 9 of Directive 2013/36/EU [...]'.

needs for borrowers' protection and crowd-lenders' transparency, while the definition as payment institution only covers some of the platforms' activities, which also include *inter alia* credit checks/due diligence on borrowers, demand/offer matching and publications of offers (E. Macchiavello, 2015).

(c) A third approach is framed under securities regulation. An investment component is generally present in LB-crowdfunding, which entails investment of money with expectation of a profit. It is no surprise, therefore, that the Italian Securities Commission (Consob) defined P2P loans as financial products and held that the public offer of the same is subject to the prospectus obligation (Consob, 2010). Nonetheless, at EU level, the Prospectus Directive and MiFID only apply to offers of, and activities in financial instruments and have therefore a narrower scope of application than U.S. securities regulation, which extends to investment securities in general. Under EU law, financial instruments include shares, bonds, notes and derivatives, but not 'investment contracts', which *per se* are not transferable on secondary markets (N. Moloney, 2010; G. Castellano, 2012). Yet, some LB-platforms are presently developing secondary markets for their products, which would then become financial instruments, while other platforms have adopted complex business models close to collective investment schemes.

However, concepts such as 'financial instrument' and 'investment (or financial) product' vary in latitude amongst countries and the definitions of investment service are also divergent in practice despite EU harmonization. Even in countries where the prospectus obligation extends to the offerings of investment products, the same often does not apply to LB-crowdfunding either because the lending volumes fall below the exemption thresholds or special exemptions are in place. In any case, EU securities law was modelled on traditional securities markets and intermediaries and would require adapting to the specificities and needs of LB-crowdfunding. In particular, the disclosure duties should be amended to reflect the needs of protection of crowd-investors, who may require specific warnings while avoiding the risk of information over-load, but also the interest of crowd-borrowers to avoid full treatment as issuers, as the relevant duties and costs could make the whole business model impracticable.

(d) A fourth approach includes bespoke regimes. Several member States (such as France, the UK, Spain and Portugal) have adopted special regimes for LB-crowdfunding (G. Ferrarini and E. Macchiavello, 2018). They commonly foresee a new type of intermediary, subject to lighter regulation than banks

and investment firms and to registration duties conditional on compliance with a few special requirements (such as a ‘fit and proper’ test for executives). In addition, member States limit the scope of the new regulated business with respect to either the size of the loan obtainable by each borrower or to the volume of the offer, to the sums investible by each lender in a project or per year, and to permissible activities.

The regimes at issue focus on disclosure obligations facilitating the adoption of an informed decision by the lenders. Platforms need to provide borrowers with information about applicable interest rate, costs and main contractual terms (e.g. repayment plan and duration) and warnings about the consequences of a default. The UK has extended its consumer credit regime to the platforms, so that borrowers can also benefit from advice referral and creditworthiness assessment obligations as well as a right to withdraw. Due diligence obligations in the selection of borrowers by the platforms are recognised in France and partially in the Netherlands, while in the UK platforms simply need to disclose their selection criteria to the public and warn about the need to conduct additional due diligence before investing, unless a creditworthiness assessment obligation exists on the platform or institutional crowd-lenders under the applicable consumer credit law.

Investment-based crowdfunding

The wide variations in national practices concerning IB-crowdfunding not only derive from different business models, but also from regulatory differences, particularly with regard to key concepts such as ‘investment product’, ‘financial instrument’ and ‘investment service’.

(a) A first approach to IB-crowdfunding is framed in terms of securities regulation. Some countries, like the Netherlands (E. van Kranenburg, 2014), apply securities laws to crowdfunding activities and require IB-platforms dealing with financial instruments to hold a MiFID license and fully comply with the relevant regime. Other countries do not enforce MiFID and/or the prospectus requirements with respect to IB-crowdfunding, either because the products offered by platforms are not considered as financial instruments (e.g. profit-participation loans in Germany and silent partnerships in Austria) or a general exemption exist for brokers not handling client money (Germany) (Peter Mayer and Robert Michels, 2015).

Moreover, answers as to which investment service is performed in IB-crowdfunding might differ among countries, also depending on business models, with variations in terms of capital requirements, conduct rules, liability rules and available exemptions. As regulators suggested, the service of reception and transmission of orders would better suit IB-crowdfunding (ESMA, 2014), but other services could also fit depending on the business model adopted, such as execution of orders, placement without firm commitment, investment advice (France: AMF and ACP, 2013, 9) and operating a multilateral trading facility-MTF (Belgium and Luxembourg: Oliver Gajda et al., 2014).⁶² In some cases, also the management of a collective investment scheme might be identified.

(b) A second approach includes ad-hoc regimes for IB-crowdfunding. However, the countries that have adopted a special regime show relevant differences as to the approach followed and the solutions adopted. To start with, the UK introduced a special regime for IB-crowdfunding in 2014, which however reflects the approach previously followed by the UK financial authority under the laws generally applicable to IB-crowdfunding (FCA, 2013). In principle, IB-crowdfunding is regarded as a regulated activity, the type of which depends on the business model adopted and may not even coincide with one of MiFID's activities, being subject to a lighter regime (e.g. financial promotion and 'arranging deals in investments' when intermediaries only bring together an issuer with potential sources of funding). Moreover, the tied agent exemption is applicable under Art. 29 MiFID to platforms acting as agents of an investment firm and therefore under the latter's responsibility.

Italy and France dedicate a non-MiFID regime to IB-crowdfunding exploiting one of the exemptions foreseen by Art. 3 of the Directive. The Italian law on equity crowdfunding implicitly considers the same as reception and transmission of orders, while French law defines crowdfunding services as investment advice. In Spain, the law on crowdfunding assumes that the same does not fall under either banking or investment services regulation, rather reserving a legal monopoly to crowdfunding platforms. Portuguese law similarly considers crowdfunding services relative to financial instruments as non-MiFID activities, however (unlike Spanish law) it allows banks and investment firms to offer crowdfunding services (G. Ferrarini and E. Macchavello, 2016).

62. The MTF qualification was rejected by ESMA for the lack of multiple buyers and sellers: ESMA, 2014.

Nonetheless, common trends are identifiable. Most national laws do not apply the Prospectus Directive and MiFID to crowdfunding, rather designing tailored obligations. Some of them also foresee new dedicated providers (as in Italy, France and Spain), while others do not (UK, Austria, Germany). The new dedicated providers are however restricted in terms of permissible products and activities, as they are not allowed to offer other investment services and to hold clients' money or securities unless they have been authorised as payment institutions. The authorisation process is rather simple, generally consisting of checks about managers and shareholders and a minimum initial capital, possibly as an alternative to professional insurance. In addition, platforms are subject to the supervision of a financial markets authority. Most regimes also allow traditional financial institutions to conduct crowdfunding operations (except for Spain), however extending to them the special crowdfunding requirements, in addition to the general ones.

Ad hoc regimes for IB-crowdfunding are mostly focused on disclosure obligations about the platform, its risks and costs, and past performance, special warnings and other business conduct rules (fair conduct and efficient orders management), but generally do not foresee prudential requirements (except for the UK). Many countries have also introduced limits to the sums investible by retail investors, while professional investors, HNWIs or legal persons and sometimes people receiving regulated advice find no limitations. Such limits are generally referred to investments per project and per year, per issuer and per platform, or only per issuer, with some limits depending on income. Limits are often set also with regard to the amount that each issuer can obtain through the platform or on a given platform or in general through crowdfunding platforms. Investor tests or appropriateness assessment are required only in some countries, while in France platforms, being investment advisors, need to perform a suitability assessment.

4. Policy approaches to crowdfunding

In a forthcoming paper, my co-author and I suggest some policy guidelines for the promotion and regulation of marketplace investing in the CMU (G. Ferrarini and E. Macchiavello, 2018). In line with the UK regulatory model,

IB-crowdfunding should basically remain subject to investment services regulation, as also argued by ESMA in its 2014 opinion, while LB-crowdfunding should fall under a new harmonized regime tailored on its specificities, taking however into account the similarities with IB-crowdfunding. Indeed, several provisions should be common to both types of crowdfunding and create a consistent regulatory framework, possibly catching all types of marketplace investing (along the UK model of regulation).

IB-crowdfunding

IB-crowdfunding no doubt implies some form of intermediation between issuers and investors. However, in order to fall under MiFID, the relevant service should refer to a financial instrument. The financial instruments most frequently issued through crowdfunding are 'transferable securities' such as shares or bonds (dubbed as 'mini-bonds' when issued by SMEs). Nevertheless, in some member States IB-crowdfunding relates to forms of equity participation that are not considered as financial instruments under national interpretations of MiFID. The absence of a financial instrument in principle bars such type of crowdfunding from qualifying as an investment service under MiFID I and II. Clearly, the instruments issued are functionally similar to shares, even though they cannot be defined as transferable securities. From the perspective of investor protection, substance should prevail over form and the absence of a transferable security should not be relevant. We suggest therefore that MiFID should be amended so as to clarify that the concept of financial instruments also includes instruments other than transferable securities, when they are offered to retail investors on a marketplace investing platform. This would extend the scope of MiFID also to platforms where silent-partnership participations and accounts receivable are sold to investors.

Moreover, in order for an investment service to be performed, the digital platform should not restrain its activity to the mere listing or generic promotion of investment opportunities, but offer a facility for the execution of transactions between issuers and investors. If this happens, the type of investment service performed needs to be identified. As argued by ESMA, the reception of orders from investors and the transmission of the same to issuers is the service or activity most likely carried-out by IB-crowdfunding platforms, in the absence of regulatory constraints (ESMA., 2014). However, the subscription of financial

instruments through the platform might even account as execution of orders when the platform acts on behalf of clients to simplify procedures and investor relations management. ESMA further argued that the service/activity of investment advice is generally not part of the crowdfunding model. However, depending on how platforms present their clients' projects, they might in fact make recommendations constituting investment advice.

From a policy perspective, MiFID is flexible enough to host IB-crowdfunding in any of the specifications found in practice. The definition of the relevant service as either brokerage, execution of orders, investment advice or placement will mainly depend on the type of agreement entered into by the parties, which is sometimes determined *ex ante* or at least influenced by the applicable national law. The applicable MiFID regime will depend on the type of service rendered through crowdfunding and be proportionate to the same. In principle, therefore, MiFID II does not need to be amended to reflect more clearly crowdfunding activities. However, level 2 provisions might offer useful criteria for identifying the type of investment service which is offered in practice in a more harmonised way across member States and to introduce partial facilitations based on the proportionality principle in the presence of special warnings and limits to the investible sums and to the sums obtainable by crowd-investees.

A different question is whether and to what extent issuers should be bound by disclosure duties in investment-based crowdfunding. In a previous paper, I argued that given the small size of issues crowdfunding offers are generally exempt from prospectus requirements and that this is justified on policy grounds given the transaction costs of disclosure and the type of offerees in crowdfunding transactions (G. Ferrarini and A. Ottolia, 2013). Similar arguments are fully developed by recent scholarship suggesting that while crowdfunding poses real risks for funders, neither the classical regulatory techniques of securities or consumer law provide an effective response (Armour and Enriques, 2017, who do not consider however the investment services approach to crowdfunding followed in this paper).

LB-crowdfunding

LB-crowdfunding shows clear differences to traditional banking, to the extent that the platform operator does not undertake the credit and other risks (such as interest rate and liquidity risks) of the lending activities performed

on the platform, and does not collect deposits. The platform operator is a 'transparent' intermediary, rather than a 'opaque' one like a bank. Its activity is essentially that of a broker intermediating loans between individuals (or professional investors) who lend money on the platform and individuals (or firms) who borrow money from them. Also the risks run by the platform are mainly of an operating character, while the platform's clients bear the credit and other risks of the lending transactions.

Therefore, from a functional perspective, the firms active in LB-crowdfunding should be regulated similarly to investment brokers and so similarly to firms running IB-crowdfunding platforms. However, when the platform is given discretion as to the investment of clients' money in loan transactions, the relevant service is rather similar to that of a portfolio manager. In fact, the lenders do not choose their borrowers directly, but instruct the platform to choose the same and lend them money according to criteria specified *ex ante* (such as the rating of clients, the number of transactions, their maturity, etc.). To the extent that discretion is exercised by the platform, the same should be regulated similarly to portfolio managers. Moreover, when the platform collects money from clients without resorting to a third-party payment services provider, some of the requirements provided for payment institutions (such as those on client money segregation for payment accounts) should be applicable to ensure the diversity from the bank business.

Also the different nature of the products dealt with on LB-crowdfunding platforms should be taken into account, for loans generate needs for investor protection somehow different from those concerning financial instruments. To be true, transferable securities could in theory be issued also for LB-crowdfunding, which is actually the practice in the U.S., where loans granted to individuals (P2P) or firms (P2B) are first securitised and then sold to clients of crowdfunding platforms. Such a practice makes the two types of crowdfunding very similar and both subject to SEC jurisdiction. However, the analogy between IB- and LB-crowdfunding is strong even when the latter does not foresee the issuance of transferable securities, but the investors get slices of loans collectively extended by them through the platform. Building on this analogy, UK law treats the two types of crowdfunding similarly, broadly applying the same rules to them (disclosure and conduct of business rules, client money protection and minimum capital requirements) but restricting, in the case of

IB-crowdfunding, the types of investors allowed given the greater riskiness and illiquidity of the instruments offered to them and extending to crowd-borrowers, in the case of LB-crowdfunding, relevant consumer protection measures.

The regulation of LB-crowdfunding platforms could be modelled on MiFID II regulatory framework for investment firms. The licencing regime should be similar and a mutual recognition system should also be adopted, in view of the formation of a EU market in alternative finance. Furthermore, the prudential requirements should be modelled on the types of services for which a licence is sought, which generate different investor protection needs depending on whether brokerage and/or advice and/or management services are offered to crowd-funders. Capital adequacy requirements should be proportionate to the risks undertaken by the platform. To the extent that the platform operator does not undertake the risks typical of lending, the capital requirements should be mainly tailored on operating risks.

Moreover, platforms and their operators should be soundly organized and governed, so as to reduce the risks of their activities to investors. Reference to the criteria presently in force for other intermediaries and also for trading venues (such as those included in MiFID II and CRD IV) should offer a model for tailoring the governance and organization requirements of marketplace investing firms. As anticipated, clients' money protection should largely depend on whether the platform is allowed to keep the money and/or assets of clients, in which case tools like segregation of assets and the relevant regime should be resorted to. If payment services are offered, the relevant provisions of the Payment Services Directive should apply. In addition, guarantee funds could be set-up and made mandatory for platforms to the extent that they can incur in liabilities towards clients.

MiFID II approach to conduct of business rules should be followed in the sense that, once more, the applicable duties – such as those of care and loyalty, diligence in borrowers' selection and checks, and conflicts of interest management - shall depend on the type of service offered and of investor contacted (professional or retail). In addition, limits should be introduced as to the amounts of money that retail investors are allowed to lend through the platforms, along the national requirements presently in force in some member States. Mandatory disclosure should cover both the platform and its operator and the investments offered on the same. Special disclosure criteria should be

provided for the loan portfolios offered to investors on platforms managing the same on investors' behalf.

5. Expanding the scope of enquiry: payment services and PSD 2

In this section, I consider the EU Payment Services Directives as an example of regulation facilitating the disruption of traditional banking by FinTechs and promoting competition between payment services providers in Europe.

PSD 1

Directive 2007/64/EC on payment services (PSD 1) was adopted to further the proper operation of the single market in payment services through legal harmonisation. Indeed, the payment services markets of the Member States were organised separately along national lines and the legal framework for payment services was fragmented into 27 national legal systems. PSD 1 was intended to establish a modern and coherent legal framework for payment services at Community level and to support the Single Euro Payments Area (SEPA), a major payments industry initiative aimed at eliminating differences between domestic and cross-border payments within the euro area (European Commission, 2012). The Directive tried, in particular, to ensure a level playing field for all payment systems, in order to maintain consumer choice, safety and efficiency. It also aimed to ensure the coordination of national provisions on prudential requirements, the access of new payment service providers to the market, information requirements, and the respective rights and obligations of payment services users and providers (A. Janczuk, 2016).

PSD 1 has established a single licence for all providers of payment services which are not connected to taking deposits or issuing electronic money. It introduced, therefore, the new category of 'payment institutions', by providing for their authorisation subject to a set of strict and comprehensive conditions. The latter include prudential requirements proportionate to the operational and financial risks faced by such bodies in the course of their business. These requirements reflect the fact that payment institutions engage in more specialised and limited activities than banks, thus generating risks that are narrower and easier to monitor and control.

PSD 2

Directive (EU) 2015/2366 on payment services (PSD 2) was adopted following a review of PSD 1 showing that significant areas of the payments market, in particular card, internet and mobile payments, remain fragmented along national borders. Many innovative payment products or services did not fall within the scope of PSD 1. In general, 'it has proven difficult for payment service providers to launch innovative, safe and easy-to-use digital payment services and to provide consumers and retailers with effective, convenient and secure payment methods in the Union' (4th considerandum of PSD 2). As argued in a Green Paper preceding the adoption of PSD 2, SEPA should be a springboard to creating a competitive and innovative European payments markets with particular regard to on-line or internet payments (e-payments) and mobile payments (m-payments) (European Commission, 2012, 2).

No doubt, after the adoption of PSD 1 new types of payment services have emerged, especially in the area of internet payments (G. Gimigliano, 2016). Moreover, technological developments have given rise to the emergence of a range of complementary services, such as account information services, which provide the user with aggregated online information on one or more payment accounts held with one or more payment service providers and accessed via online interfaces of the account servicing provider (28th considerandum). Another new type of service are payment initiation services where the provider offers comfort to a payee that the payment has been initiated in order to provide an incentive to the payee to release the goods or deliver the service without undue delay (29th considerandum). As a result, the list of payment services in Annex 1 to PSD 2 includes both payment initiation services (No. 7) and account information services (No. 8). The former is defined as 'a service to initiate a payment order at the request of the payment service user with respect to a payment account held at another payment service provider'. The latter means 'an online service to provide consolidated information on one or more payment accounts held by the payment service user with another payment service provider or with more than one payment service provider' (Article 4, 15 and 16, PSD 2).

One of PSD 2's core provisions concerns the access of payment institutions to accounts maintained with a credit institution: "Member States shall ensure that payment institutions have access to credit institutions' payment accounts

services on an objective, non-discriminatory and proportionate basis. Such access shall be sufficiently extensive as to allow payment institutions to provide payment services in an unhindered and efficient manner” (Article 36). As a result, customers will be allowed to initiate payments at their bank via authorized Third Party Providers (TTPs), such as payment initiation services providers (PISP) and account information service providers (AISP) to whom the bank will be obliged to open its account interfaces (Deutsche Bank and PPI, 2016) through ‘application programming interfaces’ (APIs) (PwC, 2016).

Other provisions relate to PISPs and AISPs. First, member States must ensure that a payer has the right to make use of a PISP to obtain payment services (Article 66 (1) PSD 2). Moreover, when the payer gives its explicit consent for a payment to be executed, the account servicing payment service provider (AS PSP) shall perform all actions in order to ensure the payer’s right to use the payment initiation service (Article 66 (2) PSD 2). Second, member States shall ensure that a payment service user has the right to make use of services enabling access to account information (Article 67 (1)). The AISP shall provide services only where based on the payment service user’s explicit consent and access only the information from designated payment accounts and associated payment transactions, without requesting sensitive payment data linked to the payment accounts (Article 67 (2)). Moreover, the AS PSP shall communicate securely with the AISP and treat data requests without discrimination (Article 67 (3)).

6. Conclusions

In this paper, I have tried to show two main policy approaches to FinTech regulation in Europe. The first is exemplified by crowdfunding regulation. Investment-based crowdfunding in principle falls under MiFID I and II, although national regulations are still fragmented in practice and a number of member States have adopted ad hoc regimes substantially deviating from the MiFID’s provisions. Loan-based crowdfunding is mainly regulated at national level with supervisors making reference to either banking or payment regulation or to ad hoc provisions which are in some countries common to investment-based crowdfunding. Given the variety of national approaches, I

have suggested that EU reform should harmonize the regulation of both types of crowdfunding under a functional approach, which should be essentially grounded on securities regulation principles.

The second approach is exemplified by payment regulation. Both PSD 1 and PSD 2 are aimed not only to protect the clients of banks and payment institutions, but also to promote competition between the payment services providers and to integrate the EU payment markets. PSD 2 in particular is intended to cover new types of payment services (such as payment initiation services and account information services) and the relevant institutions, and to open access to the payment accounts held by the clients of the latter institutions either at banks or other payment institutions, once more promoting competition in this area and the development of new services in the area of e-payments and m-payments.

The two approaches analysed in this paper show that FinTech does not always deserve radical reforms. In some cases, existing financial regulation can be adapted to FinTech innovation without extensive amendments, as in the crowdfunding area. In other cases, deep changes are needed, such as the ones briefly analysed in EU payment regulation, which has undergone profound restructuring in a relatively short time span given the rapid technological developments occurred in the last ten years. In all cases, regulators must solve a difficult trade-off between the lowering of transaction costs which is enabled by the new technologies and would suggest deregulation in the relevant areas, and the protection of either investors or users of the new services which is granted by regulation.

References

- AMF, and ACP. (2013). Crowdfunding: a guide for funding platforms and project owners. Available at: http://acpr.banque-france.fr/fileadmin/user_upload/acp/Communication/Communiques%20de%20presse/20130514-guide-professionnel-crowdfunding.pdf
- Armour, J., and Luca Enriques, L. (2017). The Promise and Perils of Crowdfunding: Between Corporate Finance and Consumer Contracts. ECGI Working Paper N° 366/2017.
- Castellano, G. (2012). Towards a General Framework for a Common Definition of “Securities”: Financial Markets Regulation in Multilingual Contexts’, 17(3) Uniform Law Review 449.
- Consob, 2010, Communication No. 10101143. Available at: <http://www.consob.it/documents/46180/46181/c10101143.pdf/3303db5a-7f82-4508-9a7f-389e49397a97>

- Deutsche Bank, and PPI, 2016, Payment Services Directive 2, White Paper, http://cib.db.com/docs_new/White_Paper_Payments_Services_Directive_2.pdf
- EBA (2017). Discussion Paper on the EBA's approach to financial technology (FinTech). EBA Discussion Paper EBA/DP/2017/02.
- EBA (2015). Opinion on Lending-based Crowdfunding. EBA/Op/2015/03.
- ESMA (2017). FinTech: A More Competitive and Innovative European Financial Sector. Consultation Document.
- ESMA (2014). Opinion - Investment-based crowdfunding. ESMA/2014/1378.
- European Commission (2016). Crowdfunding in the EU Capital Markets Union. Commission Staff Working Document SWD 154 final
- European Commission (2014). Unleashing the potential of Crowdfunding in the European Union. Communication, COM (2014) 172 final 2.
- European Commission (2012). Green Paper, Towards an integrated European market for card, internet and mobile payments. COM (2011) 941 final
- European Commission Financial Services User Group (2015). Crowdfunding from an investor perspective, 2015, 4. Available at: http://ec.europa.eu/finance/finservices-retail/docs/fsug/papers/160503-study-crowdfunding-investor-perspective_en.pdf
- FCA (2016). Call for input to the post-implementation review of the FCA's crowdfunding rules
- FCA (2013). The FCA's regulatory approach to crowdfunding and similar activities. CP13/13.
- Fenwick, M., McCahery, J., and Vermeulen, E. (2017). Fintech and the Financing of Entrepreneurs: From Crowdfunding to Marketplace Lending. ECGI Law Working Paper, No 369/2017.
- Ferrarini, G., and Macchiavello, E. (2018). FinTech and Alternative Finance in the CMU: The Regulation of Marketplace Investing, in Danny Busch and Guido Ferrarini (eds.), Capital Markets Union in Europe (Oxford, OUP, forthcoming).
- Ferrarini, G., and Macchiavello, E., (2017). Investment-based Crowdfunding: Is MiFID II Enough?, in Danny Busch and Guido Ferrarini, Regulation of the EU Financial Markets: MiFID II and MiFIR (Oxford, OUP), 659 – 692.
- Ferrarini, G., and Ottolia, A. (2013). Corporate Disclosure as a Transaction Cost: The Case of SMEs. European Review of Contract Law, 9(4), 363–386.
- Ferrarini, G., and Saguato, P. (2015). Regulating Financial Market Infrastructures, in Niamh Moloney, Eilis Ferran and Jennifer Payne (eds.), Oxford Handbook of Financial Regulation (Oxford, OUP), 568 – 595.
- Oliver Gajda et al. (eds.) (2014). Review of Crowdfunding Regulation. Interpretations of Existing Crowdfunding Regulations in Europe, North America and Israel. European Crowdfunding Network, 160. Available at: <http://eurocrowd.org/wp-content/blogs.dir/sites/85/2014/12/ECN-Review-of-Crowdfunding-Regulation-2014.pdf>
- Gimigliano, G. (2016). The Lights and Shadows of the EU Law on Payment Transactions, in Gabriella Gimigliano (ed.), Money, Payment Systems and the European Union (Newcastle, Cambridge Scholars Publishing), 25 – 38.
- Janczuk, A. (2016). Sources of EU Payments Law, in Gabriella Gimigliano (ed.), Money, Payment Systems and the European Union (Newcastle, Cambridge Scholars Publishing), 2 – 24.

Judge, K. (2015). The Future of Direct Finance: The Diverging Paths of Peer-to-Peer Lending and Kickstarter, 50 Wake Forest Law Review, 102-139; and Columbia Law and Economics Working Paper No. 520. Available at: <http://ssrn.com/abstract=2662697>

Kirby, E., and Worner, S. (2014). Crowd-funding: An Infant Industry Growing Fast. IOSCO Research Department Staff Working Paper, 8-9. Available at: <http://www.iosco.org/research/pdf/swp/Crowd-funding-An-Infant-Industry-Growing-Fast.pdf>

Macchiavello, E. (2015). Peer-to-peer lending and the “democratization” of credit markets: another financial innovation puzzling regulators, 21(3) Columbia Journal of European Law 521.

Mayer, P., and Michels, R. (2015). Changes for Crowdfunding resulting from the German Small Investor Protection Act (Kleinanlegerschutzgesetz). Available at: <https://www.dentons.com/en/insights/articles/2015/september/8/changes-for-crowdfunding-resulting-from-the-german-small-investor-protection-act>

Moloney, N. (2010). How to Protect Investors: Lessons from the EC and the UK, CUP.

Ross, S.A. (1989). Institutional Markets, Financial Marketing and Financial Innovation. *Journal of Finance*, 44, 541–56.

Surowiecki, J. (2004). *The Wisdom of Crowds: Why the Many Are Smarter Than the Few and How Collective Wisdom Shapes Business, Economies, Societies and Nations*, New York, Doubleday.

Van Kranenburg, E. (2014). The Netherlands, in Oliver Gajda et al. (eds.), *Review of Crowdfunding Regulation. Interpretations of Existing Crowdfunding Regulations in Europe, North America and Israel*. European Crowdfunding Network, 160. Available at <http://eurocrowd.org/wp-content/blogs.dir/sites/85/2014/12/ECN-Review-of-Crowdfunding-Regulation-2014.pdf>

China's Path to FinTech Development

by Xiao Xiang, Zhang Lina, Wang Yun and Huang Chengxuan⁶³

Abstract

In recent years, FinTech, driven by a combination of factors such as technological advances, financial deepening, and changing customer bases, has been growing rapidly in China, creating significant impact on traditional financial products, businesses, services, and organizational structure. This paper provides a systemic summary of China's FinTech development on multiple dimensions including main business forms and technologies, focusing on the regulation and self-regulation of China's FinTech industry, offering an in-depth analysis of the challenges the industry faces, and proposing corresponding recommendations to promote development.

1. Introduction

Born in response to economic needs, the field of finance has been driven by an inherent impetus to absorb valuable elements, including technological innovation, to benefit its growth. The development of China's financial sector has been accompanied by continuous technological advances. After financial electronization and informatization, Internet Finance began to grow rapidly in China and gained widespread recognition since 2013, thanks to the development of new network information technology, giving rise to various

63. All authors currently work at the National Internet Finance Association of China(NIFA).

new business forms and models such as third-party payment, P2P loans, and crowdfunding, and creating a series of innovative Internet Finance businesses driven by data and technology, while prompting traditional financial institutions, represented mainly by commercial banks, to accelerate deployment of strategies and businesses in this new area, thus improving the breadth, depth, and precision of the application of emerging network information technology in finance. China's many years of practicing Internet Finance has proved that Internet Finance can play a positive role in promoting financial inclusion, boosting the quality and efficiency of financial services, and meeting diverse financing and investment demands, making it a sector with significant market and development potential.

Since 2015, FinTech has gained worldwide attention and become a global topic, with converging understanding of its concept by various countries and relevant international organizations, as in the case of using Alternative Finance in the UK to refer to FinTech in the earliest stage and the term Digital Finance used in technical documents by international organizations such as the World Bank. The concept of Internet Finance was created against the backdrop of China's endeavor to push forward the "Internet Plus" strategy across all industries and thus bears unique Chinese characteristics and time-specific features. Judging from their financial function and business nature, we maintain that the above concepts are not fundamentally different when we delve into their shared essence. In China, both FinTech and Internet Finance refer to the new characteristics, platforms, and business forms in the area of finance, created by the marriage between finance and technology, driven by financial needs and bolstered by emerging technology. The business models and innovative technologies involved in the two concepts are generally the same, which is why we shall not distinguish between the two in the remaining sections of the paper.

2. China's current FinTech development

In recent years, thanks to the widespread application information technologies such as digitization, network connection and smart technologies (In 2016, the number of Internet users in China reached 731 million, or 53.2% of the population, while the number of mobile network users hit 695 million,

growing by more than 10% for the third year in a row. The proportion of users accessing the Internet with cellphones has been increasing continuously, up from 90.1% in 2015 to 95.1% in 2016.) and the enormous market demand brought forth by the initiative to promote financial inclusion and serve the real economy, FinTech has been growing by leaps and bounds with the help of an inclusive, innovative regulatory environment, attracting vast quantities of capital and benefiting financial consumers while creating unique market and scale advantages.

China's FinTech development by business form:

(1) **Internet payment maintained rapid growth, while the number of mobile payment transactions surpassed that of Internet payment.** In 2016, the total number of Internet payment transactions reached 112.5 billion, up by 61%, amounting to a volume of 2,139 trillion yuan. Commercial banks maintained their dominant position, accounting for 97.5% of the total Internet payment transaction volume, while non-banking Internet payment, dominated by small payments, registered rapid growth, with the annual number of transactions up by 98.6% and transaction volume surging by 124.3%. As for mobile payment, transaction volume reached 209 trillion yuan, up by 60.2%, while the number of transactions was 122.8 billion, up by 128.06%.

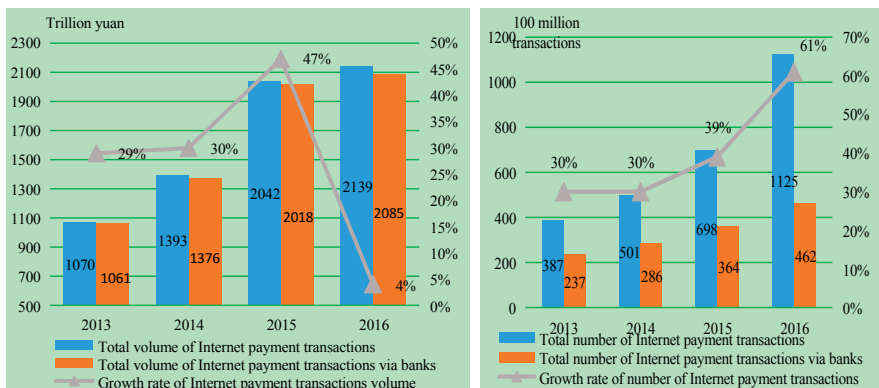


Figure 1. Internet payment transaction volume and number from 2013 to 2016⁶⁴

64. Source: Operational Report of China's Payment and Clearing Industry

(2) The number of P2P loan platforms decreased with growing trade volume and lowering rate of returns for P2P products. By the end of 2016, the number of P2P loan platforms in normal operation was 2,649, down by 28.1% from 2015. Year-end total loan balance was 803.4 billion yuan, a year-on-year increase of 84.1%, while the accumulated annual volume of loans was 1.9975 trillion yuan, a year-on-year increase of 103.3%, involving 51.09 million participants (including lenders and borrowers), up by 35.96 million from last year. Mean rate of return for investors was 9.3%, down by 1.8% from that of 2015.

(3) Internet insurance slowed down with changing proportion of sources of premium revenue; share of life insurance in Internet insurance premium rose significantly. In 2016, the total premium revenue for Internet insurance increased by 7.6% to reach 234.8 billion-yuan, accounting for 7.6% of the total premium revenue of the insurance industry. Life insurance premium revenue, in particular, grew by 32.8%, accounting for 82.8% of that of the whole Internet insurance segment.

(4) Internet consumer finance took on diverse financial service scenarios and participators, with younger users and predominantly small loans with short maturities. Taking 6 representative institutions surveyed by the National Internet Finance Institute of China for example, the number of users and the volume of new consumer loans granted for 2016 increased by 38.5% and 219.1% respectively compared to the previous year. Users of Internet consumer finance services are mainly young people born in the 80s or 90s, who have a relatively advanced concept of consumption. And the newly granted loans are mainly used for online shopping, renting apartments, purchasing vehicles, education, and vacation, etc. More than 90% of the users had a loan limit of less than 10,000 yuan, with the number of loans worth less than 1,000-yuan accounting for 80% of the total number of loans and more than 90% of newly granted loans with shorter than 6 months of maturities.

(5) Product and service models continued to evolve in Internet direct banking. By the end of 2016, 69 commercial banks in China had built Internet direct banks (excluding WeBank and MYbank). More than 80% of the direct banks were initiated by city commercial banks and rural commercial banks, forming a product and service system composed of depositing, investment and wealth management, money market funds, loans, remittance, and value-

added services, realizing rapidly expanding customer base and trade volume.

In terms of institutions, with China's traditional financial institutions moving faster into the FinTech industry, a virtuous relationship featuring both competition and cooperation between various types of market entities is gradually taking shape. The conceptual, technological, and model innovation brought about by FinTech has stimulated traditional financial institutions to continuously transform their business models and service forms, push forward strategies for FinTech development by leveraging their unique characteristics and competitive advantages, adapt organizational structure, build core brands, and improve portfolio of business forms, realizing rapid growth of client base and transaction volume in key areas such as Internet consumer finance, mobile payment, and Internet insurance. Meanwhile, traditional financial institutions and emerging Internet businesses are increasingly engaging in cross-industry, cross-institutional cooperation by capitalizing on their respective endowments. China Industrial and Commercial Bank, China Agricultural Bank, Bank of China, and China Construction Bank, for example, have embarked on cooperation with JD, Baidu, Tencent, and Alibaba respectively to explore innovative FinTech products and services, realizing a mutually reinforcing, win-win relationship and cultivating a more open FinTech ecosystem for cooperation.

On the other hand, FinTech is increasingly driven by technology, with deepening application of emerging technologies such as big data, AI, and blockchain in the financial sector in China. For example, big data has been wide applied in precision marketing, service innovation, operational management, and risk control, fine-tuning financial businesses, reducing information asymmetry, lowering marginal costs, and boosting transaction efficiency, thus enabling more financial consumers to enjoy secure, convenient financial services at reasonable prices. Meanwhile, the big data technology has made statistical monitoring, analysis, projection, and risk alerts more accurate and efficient, enabling more targeted, scientific regulation. **Cloud computing**, with its advantage in system structure and resource allocation, has contributed to the intensive development of financial services by adapting to new characteristics of Internet financial services, such as high instantaneous concurrency, high frequency, and enormous traffic, and better meeting the diverse demand of long tail customers for financial services. **The**

continuous application of AI technologies such as voice processing, image recognition, machine learning, and deep learning has enabled financial services and products to “understand words and languages”, realizing seamless connection to and synergy with consumers, helping them with financial decisions, and promoting continuous optimization of front-, mid-, and back-desk procedures within financial institutions. **Biometric Identification technologies** using such as identification of fingerprints, vocal prints, facial features, and iris has been increasingly used in scenarios such as account log-in, identity authentication, and small payments. In addition, new achievements have been made in the application of the **blockchain** in areas including clearing and custody of funding, digital notes, and capital transaction, but generally speaking, the technology is still in the nascent stage, with its use limited to lab experiments or small-scale situations and few cases of commercial or production use.

3. Regulation of FinTech in China

The advent of FinTech has provided important impetus for the deepening of China’s financial reforms, improvement of the market system, and transformation of the development model of financial development. On the other hand, FinTech is still rooted in the finance industry and falls within the confines of financing, credit creation, and risk management. FinTech has not changed the hidden, sudden, and contagious nature financial risks, nor the negative externalities they can bring. As a result, FinTech has posed a new issue and challenge to financial regulators in China. Against this backdrop, reviewing and modifying existing regulatory concepts, framework, standards, and tools to adapt to FinTech innovations have become a crucial part of China’s efforts to build a modern framework for financial regulation.

(1) Improving the system of rules and standards

In July, 2015, the People’s Bank of China, the China Banking Regulatory Commission, the China Securities Regulatory Commission, the China Insurance Regulatory Commission, and the Ministry of Finance jointly published the *Guiding Opinion on Promoting the Healthy Development of Internet*

Finance, proposing a series of policy measures to encourage innovation and support the stable development of Internet Finance in line with the general framework of “encouraging innovation, guarding against risks, leveraging pros and avoiding cons, and promoting healthy development”. The Opinion also established the principles of “lawful, appropriate, category-based, coordinated and innovative regulation” and defined the boundaries of major business forms, as well as relative regulatory requirements and division of responsibilities between regulators. As a result, the Opinion has become the guideline for China’s overall Internet Finance development.

In line with the requirements of the Opinion, relevant regulatory agencies also rolled out a series of regulatory rules for related business forms in Internet Finance. For example, the People’s Bank of China published regulation such as *Measures on Protection of Non-Financial Institution Payment* and *Measures on Management of Customer Provisions on Payment Platforms*, building a basic legal framework for payment management. The China Banking Regulatory Commission published *Temporary Measures on Management of P2P Lending Infomediaries*, *Guidance on the Documentation and Registration Management of P2P Lending Infomediaries*, *Guidance on the Funding Custody Business of P2P Lending Infomediaries*, and *Guidance on the Information Disclosure of the Business Activities of P2P Infomediaries*, forming a regulatory framework. The China Securities Regulatory Commission rolled out *Measures on the Supervision and Management of Money Market Funds*, setting out rules on information disclosure, risk disclosure, and forbidden actions for money market funds. The China Insurance Regulatory Commission publicized the *Temporary Measures on Internet Insurance Businesses*, stipulating standards on the operational condition, business scope, information disclosure requirement, and relevant regulatory rules for insurance institutions engaging in Internet insurance businesses.

(2) Exploring penetrative regulation

With the continuous development of FinTech, the business operations of institutions in the industry are becoming increasingly mixed, leading to overlapping products and compounding of businesses. To address this phenomenon, Chinese regulators actively explore the method of penetrative regulation for FinTech to see through the appearance of financial products and

identify the essence of financial businesses and activities, connecting the dots between sources of funding, intermediate links, and final destinations. Valuing essence over appearance, regulators seek to identify the entities to be regulated and applicable rules based on the function of products, business nature, and legal properties, monitoring the businesses and activities of industry institutions along the whole procedures.

In actual practice, penetrative regulation can help address new regulatory challenges brought by FinTech. First, penetrative regulation is required of all FinTech institutions engaging in financial businesses and providing financial services, irrespective of the nature of their financial products and service providers, subject to basically identical market access policies and regulatory requirements, ensuring fair and consistent regulation. Second, penetrative regulation places great emphasis on considering information along the whole business chain, including sources of funds, intermediate links, and final destinations of funds, so as to identify the essence of businesses, the entities to be regulated and applicable rules, helping to eliminate overlapping regulation and regulatory arbitrage. Third, penetrative regulation requires regulators to enhance coordination and information sharing among themselves so as to determine the risk profile and overall leverage of relevant activities and ensure total coverage of FinTech regulation. Fourth, penetrative regulation stresses the verification of end investors, identifying the undertaker of final risks and returns, implementing management of investor suitability, and ensuring the right products are sold to the right investors. Fifth, penetrative regulation focuses on the inspection of funding flows between related financial groups as well as their assets, liabilities, and governance structure, which serves to guard against unfair competition, transferring benefits for personal gains, and inappropriate related-party transactions, etc.

(3) Enhancing consumer protection

Compared to traditional financial services, FinTech is highly virtual, transcends geographic regions, and involves a large number of participants. In addition, many of the customers of FinTech are long-tail customers and disadvantaged groups, making it necessary to enhance the protection of FinTech consumers. To this end, Chinese regulators have engaged in multiple endeavors. First, build and improve the third-party custody system and require

FinTech institutions such as P2P loan intermediaries and third parties to institute third-party custody of client funds in commercial banks and ensuring the security of the funds of financial consumers. Second, reinforce information disclosure. Formulate guidelines on information disclosure and standards, urge FinTech institutions to disclose operational and financial information in a timely manner to help financial consumers gain sufficient knowledge of the operational status of the institutions and prompt industry players to operate with prudence and control relevant risks. Third, step up monitoring of Internet advertisement and urge advertising media to take on the responsibilities to review the content, realizing effective regulation of advertisements about FinTech and wealth management product. Fourth, improve management of investor suitability. Formulate management regulations on investor suitability, urge FinTech institutions to comply with investor suitability rules, and ensure financial consumers invest in products suited to the risk to their levels of risk tolerance. Fifth, push forward financial consumer education. Provide various forms of training on FinTech knowledge and issue risk alerts to improve the financial literacy and risk prevention capabilities of consumers.

(4) Performing Thematic Regulation of Internet Finance Risk

Looking back on the world history of financial development, due to the intrinsic frailty and lagging external regulations, the nascent stage of every major financial innovation often came with rapid accumulation of risks, leading to financial crises in some cases. In China, FinTech brought about certain issues and hidden risks despite its rapid development. This issue is especially poignant in the case of some “black sheep” of the industry which deviate from the right track of innovation and disrupt normal financial order, driving out players which comply with laws and regulations, severely damaging the reputation of the industry and the confidence of consumers, and endangering truly valuable Internet Finance innovations.

To address this issue, at the beginning of 2016, China launched the Thematic Regulation of Internet Finance Risk, highlighting the principles of targeting problems, regulating by category, and implementing comprehensive measures. The aim of the initiative is not to negate the benefit of Internet Finance, but rather, to protect law-abiding businesses by cracking down on

those which break the law, thereby effectively regulating operational activities and recovering a healthy, orderly environment for the development of Internet Finance. Judging from the effects of the initiative, the overall market environment has been gradually improved and a mechanism for fair market competition has been recovered, enabling businesses which obey the law to eliminate unscrupulous players. Some of the small-scale institutions which profit by luring investors in with high returns instead of building their strength in their business sectors, now have no choice but to stop their operations and seek other business opportunities, enabling orderly phasing-out of underperformers.

4. Self-regulation of China's FinTech industry

Industry self-regulation is an important mechanism where institutions and practitioners in the same industry, in an effort to protect and further shared interests, unite on a voluntary basis to formulate rules to regulate their own behavior and realize self-management within the industry. With the continuous innovation and development of the Internet Finance industry in China, ever increasing market complexities have continued to add to the direct and indirect costs of government regulation, making it necessary to introduce industry self-regulatory organizations and social resources to bring out the role of self-regulation in facilitating market communication, market-oriented constraints, and risk mitigation and serve as a conducive complement and vigorous support to the relatively rigid administrative regulation. The dynamic evolution of international financial regulation has also shown that financial regulators adjust regulatory measures based on the level of accumulated and exposed risks. With sound industry self-regulation, the industry will develop in an orderly manner. And when industry institutions practice prudent compliance, regulation will be made more flexible and effective. A lack of industry self-regulation, on the contrary, will force regulators to be less tolerant and implement stricter regulatory concepts and more rigid regulatory measures.

Against this backdrop and in line with the *Guiding Opinion on Promoting the Healthy Development of Internet Finance*, in March, 2016, the People's Bank

of China, the China Banking Regulatory Commission, the China Securities Regulatory Commission, the China Insurance Regulatory Commission, and other relevant governmental bodies jointly founded the National Internet Finance Association of China (NIFA) with the aims to regulate the market behaviors of industry institutions, protect the legitimate rights and interests of the industry, encourage industry institutions to better contribute to social and economic development, and guide the compliant and sustainable development of the industry through self-regulatory management and membership services.

Currently, NIFA has more than 500-member organizations, covering institutions in banking, securities, insurance, funds, futures, trust, asset management, consumer finance, and credit reporting, as well as Internet finance institutions in payment, investment, money management, and lending. The members also include institutions in financial institutions and financial research and education, covering main business forms as well as emerging ones in Internet Finance in China.

More than year since its inception, while adhering to normative development as the main thread, focusing on risk control, leveraging standards and rules, and relying on technological support, NIFA has performed the following tasks in line with its mission of “serving regulation, the industry and society”:

(1) Build an industry self-regulatory system and organizational structure. NIFA formulated and implemented fundamental regulations such as Approaches on Member Management, Self-Regulation Pact for Members, and Approaches on Self-Regulation and Penalty Mechanism, building a solid foundation for effective industry self-regulation. NIFA established special committees covering areas including statistics, P2P loans, credit building, cyber and information security, and mobile finance, giving full play to the functions of the committees on discussing issues, making planning, and implementing actions by relying on self-regulation and self-discipline of the industry.

(2) Push forward the building of Internet Finance standards. Taking into account top-level design and prioritizing urgent needs, NIFA founded the Research Institute of Internet Finance Standards to plan the standards system of Internet Finance, publish and implement management measures for group

standards, and formulated seminal standards covering areas such as information disclosure, contract specifications, debt collection, and Internet Finance cloud computing.

(3) Reinforcing building of industry infrastructure. NIFA launched the Internet Finance Registration and Disclosure Services Platform, connecting more than 100 P2P infomediaries, many of which disclosed their institutional, operational, and financial information to the public for the first time on the platform. NIFA's Internet Finance Statistics Monitoring and Risk Alert System collects a wide range of data from Internet Finance institutions including operational information, product anomaly, and transaction-specific information, measured against nearly 1,000 metrics, and sets 23 rules to identify abnormal platforms and thresholds to caution against risks. In addition, NIFA has launched the Internet Finance Credit Information Sharing Platform, which can effectively integrate and utilize useful information to address problems such as “a single borrower borrowing from multiple platforms” and fraudulent borrowing. Finally, NIFA's Internet Finance Complaint Information Platform serves to provide leads for financial regulators to crack down on activities in violation of laws and regulations.

(4) Providing Internet Finance training and education. NIFA has built a multi-layered, multi-dimensional training system, covering more than 1,000 trainees and nearly all member institutions in the past year. NIFA actively organizes activities such as quiz contests and campus lectures on Internet Finance, promoting the financial literacy among consumers. In addition, NIFA issued timely alerts on cryptocurrency and ICO, helping investors to enhance their ability to identify risks and achieving considerable influence both at home and abroad.

(5) Enhancing theoretical and empirical studies on Internet Finance. Each year, NIFA compiles the China Internet Finance Annual Report to provide a comprehensive view of and deep insights into the current development and future trends of China's Internet Finance industry. As for research, NIFA has carried out targeted research on empirical issues such as the various business forms of Internet Finance, and the application of RegTech and blockchain in finance, as well as hot issues or difficult issues such as the orderly phasing-out of P2P loan platforms, digital currency, ICO-related risks and regulation, achieving multiple research results.

(6) Stepping up international exchange and cooperation. In the presence of Chinese Premier Li Keqiang and Luxembourg Prime Minister Xavier Bettel, NIFA and Luxembourg House of Financial Technology signed a Memorandum of Understanding to enhance civil communication and cooperation in the field of Internet Finance between China and Luxembourg. Furthermore, NIFA jointly held the UK-China FinTech Collaboration Forum with the Department for International Trade UK, and received visits by the World Bank, Inter-American Development Bank, Financial Conduct Authority, and the City of London government, enhancing the international community's understanding of China's Internet Finance development and work in self-regulation.

5. Challenges facing the FinTech industry in China

Currently, China's FinTech industry is in a leading position globally in terms of growth rate, market volume, and innovation capabilities, garnering increasing international following. With rapid development, however, certain problems and challenges are being exposed and accumulating, calling for serious attention and resolution with systemic plans.

(1) Negligence of the financial essence of FinTech. Without a sufficient understanding of the roles of finance as the core and technology as the medium in FinTech, certain FinTech practitioners deliberately isolate finance from technology and blow the importance of technology out of proportion while ignoring fundamental financial rules, leading to "excessive innovation" which goes beyond the development stage of the institutions in question and the economy at large and beyond their risk control capabilities, as well as "pseudo innovation" which deviates from actual economic needs purely to stand out. Meanwhile, given FinTech's short history, startups in the industry have not experienced the test of financial risks, leading to insufficient awareness of risks and inadequate risk management capabilities. In addition, the big data model and pricing system which FinTech relies on, have not yet gone through the test of complete economic cycles, leading to uncertainties about the efficacy of the models during economic downturns in particular.

(2) Compounding of financial and technological risks. As an ancient Chinese saying goes, “The water that bears the boat is the same that swallows it up.” Advanced technologies, if used improperly in finance, could be the very force that brings more serious damage to financial activities and the finance industry as a whole. For example, FinTech, in providing financial services across markets, institutions, and geographic regions, also renders financial risks more contagious and the scope of potential damage greater. In speeding up and increasing the flow of funding, it also accelerates the rate of spreading risks and financial losses. In making infrastructure and financial services more open and transferring them online, it also accumulates risks related to reliance on technology and network security. Furthermore, by relying on the Internet and economy of scale, players in the industry find it easier to engage in mixed operations, which may give rise to issues such as unfair competition and systematic risks.

(3) Impact on monetary policies. When it comes to policy tools, certain FinTech businesses can, to some extent, create currency, blurring the boundaries between traditional currencies and lowering the effectiveness of quantitative monetary tools pegged to supply of broad money. In terms of transmission of monetary policies, FinTech increases uncertainties about liquidity demand in the financial market, which may augment market volatility and make it more difficult and more costly for central banks to engage in open market operations. As for the intermediate targets of monetary policies, with the rapid expansion of electronic currencies brought about by the likes of Internet payment, currency in circulation will be reduced, creating more uncertainties in the estimation of money multipliers, velocity of circulation, and demand function, and making the intermediate targets of traditional monetary policies less effective.

(4) Increasing the difficulty in consumer protection. The long-tail customers, who are the focus of FinTech businesses, often lack financial literacy and capabilities, and require more protection. In addition, certain population groups such as farmers and low-income citizens often lack FinTech knowledge and skills, giving rise to “digital divides” between citizens of different levels of education, different ages, and from different regions and leading to disparities in the abilities of different groups to benefit from financial services. Moreover, disadvantaged groups are more reliant on

physical branches, which may lead them to reject FinTech when more physical financial service spots are transferred online.

Furthermore, there is still room for improvement in infrastructure building, development of original business models, R&D of core technologies, improvement of regulatory and governance systems, and formulation of industry standards for China's FinTech development.

6. Recommendations for China's FinTech development

Looking into the future, China's FinTech industry will face changing macro conditions such as economic, social, technological, and financial elements. The new normal of the economy and the development of digital economy will further complicate the operational environment of FinTech players, the formation of the social cyberspace and the continued accumulation of people's wealth will provide a solid customer base for the industry, the deepening of informatization and ongoing technological advances will create highly efficient information infrastructure and technological conditions for the industry, and the building of a modern financial system will cultivate a more sound financial market and regulatory environment for FinTech. Generally speaking, in the future, the opportunities and the pros outweigh the challenges and the cons for China's FinTech industry, ushering in a beneficial period for the industry's development.

To grasp the valuable opportunities for FinTech development, address the challenges therein, and promote the normative, healthy development of China's FinTech industry, industry players, regulators, and industry self-regulatory organizations should evaluate all FinTech activities by examining the basic principles of whether they are conducive to improving the efficiency of serving the real economy and the level of financial inclusion, to enhancing the financial risk control capabilities, and to strengthening consumer protection, and engage in FinTech innovations in proactive, steady, and orderly manner in line with the principles.

(1) Continuously optimize policy environment. Adhere to fair access to the market, equitable competition, and just rules for players in the FinTech market and endeavor to break unreasonable policy constraints and systematic

bottlenecks so as to enhance the intrinsic impetus for FinTech development. Foster a favorable policy environment for the development of FinTech with coordinated and integrated monetary, credit, fiscal, and tax policies and accompanying policies, each with its own priorities.

(2) Enhance support for innovation. Encourage traditional financial institutions and emerging FinTech businesses to leverage their own advantages within the limit of laws and regulations, and engage in innovation of diverse, tailor-made, and precise FinTech products and services driven by market demand and supported by new technologies, so as to improve the competitiveness of the FinTech industry and cultivate leading FinTech enterprises with global edge.

(3) Improving the governance system. Establish a sound system for behavioral regulation, prudent regulation, and market access for FinTech, and utilize FinTech to improve the procedures and capabilities in regulation, explore innovative governance mechanisms for FinTech, including regional pilot programs, product testing, and pressure tests, and bring under control the risks created by innovation. Meanwhile, give full play to the role of industry self-regulation in lowering the overall risk probability of the industry through formulation of industry standards on information disclosure, information safety, and business operation and urge industry institutions to enhance risk control capabilities.

(4) Improving infrastructure. Increasing diversified investment from the public and private sectors, and further improve infrastructure systems including those for payment, clearing, and communication, so as to enable FinTech services to spread to a wider range in a secure, credible, and economical manner. Build and improve infrastructure such as statistics, risk monitoring, and credit information systems to consolidate the foundation for the sustainable development of FinTech. Accelerate the building of standards system to improve the level of standardization of the FinTech industry.

(5) Strengthen consumer protection. Practice the concept of “responsible finance to improve the management of investor suitability. Properly resolve the issue of “digital divide” and prevent new financial inequality. Explore measures such as digital, visual information disclosure, product registration, and risk alerts to enhance the transparency of the the whole procedures of FinTech services. Take advantage of a wide range of channels such as

traditional and digital media to provide precision education on financial knowledge systemically, and improve consumers' capabilities and literacy in FinTech.

7. Conclusion

Nowadays, with its vigorous innovation capability and vitality, FinTech is making the finance industry faster and more efficient and enabling better financial services and products. Amidst the global FinTech boom, China now stands at the forefront of the industry. However, we must still observe, analyze and explore the FinTech industry from multiple perspectives with an objective mindset, striving to build, in a steady fashion, a system of FinTech services and governance which is truly suited to China's economic and financial development so as to realize steady and fairly fast growth of business volume, improve the efficiency of serving the real economy and the level of financial inclusion, and continuously improve the ecosystem and industrial chain of the industry, thus enabling innovation and technology to play a more important role in driving FinTech, significantly improve risk control and governance capabilities, and maintaining China's leading position in FinTech development.

ISSN 2421-6917

PUBLISHED BY

Europeye srl

via Gregorio VII 368 - 00165 Roma

t. 06 3700556 - www.europeye.com