

# The Impact of Fintech on Banking

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## 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.<sup>52</sup> 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.<sup>53</sup> 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

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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*,<sup>54</sup> 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.

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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.<sup>55</sup>

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

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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.”<sup>56</sup>

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.<sup>57</sup> 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.<sup>58</sup> 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

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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.

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