Proceedings of the 8th International Conference on Economic Management and Green Development
DOI: 10.54254/2754-1169/111/2024.17741

The Impact of FinTech on Banking: A Few Samples

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Abstract: With the rapid development of technologies, financial technology, also known as fintech, has been playing an increasingly important role in the development of the banking system. This article, taking a few products and services that emerged from financial technology and the technologies applied to financial technology as samples, provides an overview of researches on the impact of financial technology on the banking industry. It focus on credit, deposit and financing services, payment, clearing and settlement services, digital currency and investment management services including transactions. The main topics discussed in the article are: using P2P platforms as an example to discuss the impact of financial technology on credit, deposits, financing, and whether it will replace traditional banks; the role of cryptocurrency relative to fiat currency in the central bank payments and settlements, as well as the impact of smart contracts generated by blockchain technology on the banking industry and its activities.

Keywords: FinTech, Banking, P2P Lending, Cryptocurrencies, Technologies.

1. Introduction

1.1. Fintech

The Financial Stability Board defines fintech as: Technology-enabled innovation in financial services that could result in new business models, applications, processes or products with an associated material effect on the provision of financial services. A simple definition can be expressed as the application of technology in the financial sector, and the development of fintech is not limited to specific services, but to all the products and services provided by the industry [1]. The financial sector's technological innovation to stimulate entrepreneurship, disintermediation, reform traditional systems, resolve supervision problems as well as promote economic prosperity is another classification of fintech [2].

Modern preferences for digital high-demand customers, rapid technology development and tighter regulation of financial markets after the 2008 crisis are two main causes for the fast development of financial services driven by technologies, and fintech brings new prospects for platforms connecting traditionally isolated digital financial services. It is widely believed to provide higher transparency and information access, provide lower transaction costs [3], improve business processes with fast innovation and flexibility, make consumers more advantages than traditional banking system [4]. Diemers [5] added that the government, entrepreneurs and financial organizations are the three main parties to establish complex financial technology network.

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The fintech revolution is defined as the continuous and innovative use of technology in financial services and design that completely changes the working habits and mindset of financial service personnel [6]. Arner et al. [1] defined these changes in the financial sector with the rise of technology as three time spans: Fintech 1.0 (1866-1967), Fintech 2.0 (1967-2008) and Fintech 3.0 (2008-present). After 3.0, they proposed Fintech 3.5, in which fintech changes of emerging markets in Asia and Africa will be explicitly focused. And in 3.0 stage the vigorous development of technical support and the rich technical labor force flew into the labor market further support the rapid development of financial technology in growth and establishment [7], and has been in service for consumers, such as mobile payment, P2P Lending, robot, the consultant, the raise, shadow banking, digital currency, etc. Financial technology revolution will change consumers from paper payment, card and payment into key payment [8]. Lee and Shin [9] believe that considering the number of global targeted investment and the number of users using fintech services, it is clear that fintech has been transformed into one of the most important contributors to the financial services industry. However, contrary to the above viewpoint, Vives [10] claims that the global fintech industry is much smaller in size than traditional financial industries, considering the size of the currency owned by financial intermediaries and the size of the financial assets they trade in the capital markets. Fintech innovation brings transparency, information availability, and lower costs for individual lenders and borrowers than for transactions through intermediaries (banks) [11]. Internet and the complicated information technology infrastructure used to provide fintech products and services can reduce transaction costs, in which cost savings are transferred to consumers as cost-effective.

1.2. Banking

In any financial system, banks are important parts of financial intermediaries. Generally speaking, the revenue of a bank is equal to the result of subtracting the interest or expense income generated by the assets it creates from the customer's liabilities. It is worth noting that the classification criteria of traditional banks are usually based on four key ratios, including loan to asset ratio, core deposit to asset ratio, number of branches to asset ratio, and the percentage of revenue generated through traditional banking business to total revenue. The average of at least three of these four key ratios must be higher than the average level [12]. The abolition of the Glass-Sigel Act and the established Gram-Rich-Biliey Financial Services Modernization Act allow commercial banks to engage in deviations from the traditional functions of commercial banking [13]. Thus, despite competition and threats being excluded from normal intermediary functions, the banking industry has managed to survive through fees, such as annuities, mortgages, mutual funds, pension funds, guarantees, banking insurance and so on. Since then, although the banking sector has shed its traditional role, its contribution to many economies remains less worrying due to the adaptability of these different revenue streams [13].

The risks faced by banks have various sources, such as market, credit, interest rates, foreign exchange, technology, operations, liquidity, and bankruptcy. Most banks fail unable to manage these risks; however, banks can avoid bankruptcy with appropriate precautions such as monitoring loan destinations, credit rationing, collateral and endorsement [13]. Moreover, because of these risks, the banking sector needs to maintain a liquidity buffer with regulators and needs to constantly update technological developments as part of improving service quality and increasing profits. The introduction of ATMs, debit cards, credit cards, POS machines,mobile banking Service, online banking represent the modernization of customer immediacy and demand [14]. These updates and improvements are key components of consumer satisfaction and loyalty.

Traditional banks start with the concept that consumers trust a group of experts to safely preserve their savings while providing a return on funds at specific locations. However, with the expansion of banking business, its focus is gradually shifting towards the establishment of branch offices to extend

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services to customers in different regions. From a consumer's point of view, it's about to be unique, mobile, and accessible anytime, anywhere. Therefore, flexibility is a factor affecting the use of financial services rather than direct transactions. The trust of consumers has changed after the banking system has evolved from Bank 1.0 to Bank 4.0, as the place where they safely store funds has changed from banks to technology platforms, King [15] added. As a result, as the concept of fintech provides 24 / 7 service to customers, their reliance on traditional financial institutions (physical models) is fading. Lin [16] believes that despite the development of technology and improved competition, the main function of traditional financial institutions has not changed. In 1980s, when ATMs came out, banking took a different look, driving the revolution in self-service banking and revolutionizing the system. Banking 3.0 has become an era where consumers can choose banks anywhere because of the Internet and smart phones, which eliminates people's trust in branches with banking utility and relies on — as a platform to provide services with banking needs for customers [15]. Internet of Things (LoT) used in the banking industry is a symbol of Banking 4.0. Banks believe that the changes and developments brought about by these technologies provide greater cost savings in the services provided [15]. The launch of online banking is also a major success. Most banks will shift from product-centric to customer-centric when developing e-banking, where services such as online shopping and online transactions is one of the key contributions of online banking to every economy they operates.

1.3. Problem Formation

The fintech areas are: credit, deposit and financing services; payment, clearing and settlement services, including digital currency and investment management services, including transactions. With large technology companies offering virtual wallets such as Apple Pay, P2P lending platforms providing alternatives to bank loans, and existing cryptocurrencies such as Bitcoin and new cryptocurrencies providing alternatives to non-legal currencies for cash, it is meaningful to study the impact of fintech on commercial banks' business activities. This paper mainly summarizes these issues: using P2P platforms as an example to discuss the impact of fintech on credit, deposits and financing; the role of cryptocurrencies relative to legal tender, private currencies and banks in the payment, clearing and settlement parties and the impact on central banks; and the impact of fintech pillar technologies such as blockchain technology on the banking industry and its activities.

2. One Sample Of Fintech: P2P Lending And Its' Impact On Banking

P2P loans, sometimes referred to as "market loans," are loans to individuals and businesses through online services that directly match lenders to borrowers without using the intermediary bank. When the borrower submits a loan application through P2P, the platform conducts credit analysis based on risk classification and determines the level of the lender. Then the amount of the money and interest rate will be listed for bidding, and the platform will loan the borrower based on the successful prices. The platforms themselves will not use the loans for reinvestment, as a result, no debt or equity transfer like debt-financed bank loans exist. In this sense, all funds provided by the investor who funds the loan can be regarded as investor equity. Therefore, it is believed that P2P lending is a non-intermediary finance, no bank has promised investors and borrowers a qualitative transformation of their assets with the bank's own capital.

Early P2P lending investors were mostly hedge funds and large financial institutions, with equal status for both borrowers and lenders. Researches are related to the degree of competition between P2P loans and bank loans. For example, Tang [17] assumes if there are problems with bank credit, such as a decrease in quality or quantity, the complementary or substitution relationship between P2P and bank loans will determine whether the asset quality of P2P borrowers will improve. The article

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sees the US accounting rules changes as a negative impact on the supply of bank credit and suggests that US P2P loans are a substitute to bank loans because it serves bank borrowers below the edge, but it is a supplement to small loans. de Roure et al. [18] researched the following issues: what will cause the banks lose loans from P2P platforms; what are the risk characteristics of transferring loans from banks to P2P platforms, and whether the lending rate of P2P platforms is higher than or lower than banks. To address these issues, they developed a simple model for banking and P2P loans. Banks can obtain deposits that generate rent and invest their capital in loans. Therefore, they are "leveraged lenders". The P2P platforms have no deposits and are all equity lenders. Due to their leverage, banks have the moral hazard of risk transfer, which requires sufficient equity to overcome, and P2P lenders do not have such moral hazard. In addition, due to regulation, the operating costs of banks are much higher than P2P platforms. The article predicts that if only some banks are affected by the increase in external regulatory costs and the financial strength of the unaffected banks is insufficient to reduce the impact of credit reduction on affected banks, the total market share of banks will be lost to P2P lenders; P2P platforms provide higher loan risk than banks, and the risk adjusted interest rate of bank loans is lower than that of P2P loans. The authors compared the consumer data obtained in the field with these predictions of the model, and the results showed that the actual data supported the three predictions of the theory. They also conducted ancillary tests that showed that P2P lending was the biggest advance, while consumers had the most awareness of P2P lending before regulatory capital shocks.

According to the papers by Tang [17] and de Roure et al. [18], the main conclusion is that there exists competition between P2P lenders and bank loans, but the advantages of banks often manifest in their temporary limited credit supply. When unaffected banks do not have strong financial capabilities and when their capitals are low, P2P lenders are willing to provide higher risk loans than banks, but the loans may not be cheap despite lower operating costs. P2P lenders may provide services for both marginal and over-marginal bank borrowers. P2P loans have also been influenced by bank regulation, and they have the characteristics of network effects. The number of investors owned by a platform is directly proportional to the number of borrowers, meaning that P2P platforms can benefit from the herd effect of investors. In addition, the trust of depositors and investors in P2P platforms is also an important reason for the growth of P2P loans, indicating that the Merton and Thakor [19] model predicts particularly accurate. Brostrom et al. [20] provide empirical support for this, and the article uses data to empirically study the impact of the loss of trust in banks on the growth of P2P loans. The study found that the lower the trust in banks, the higher the possibility of lenders to participate in P2P loans, and the higher the participation degree.

On the question of whether P2P lending will replace banks, Thakor [21] noted that certain loans with high risks and related regulatory costs may be transferred from banks to P2P lenders. The less people in a country use the banking system, the greater the impact will be. However, compared to other forms of loans, banks have deposit insurance and the security of storing assets here is higher, indicating that banks still have advantages and will remain the most important position. In addition, banks provide mortgage services, which is more advantageous than P2P platforms because it can reduce moral hazard and private information issues. Ultimately, although some loans are being transferred from banks to P2P platforms, this growth is unlikely to pose a significant competitive threat to the bank's lending business. But it is possible for banks to have their own P2P platforms or cooperate with P2P platforms to obtain market loans.

3. Another Sample Of Fintech: Cryptocurrencies And Its' Impact On Banking

One application involving financial technology in payment services is cryptocurrency, the most famous of which is Bitcoin, also known as digital currency. People to people transactions using Bitcoin are independent of the banking system. Bitcoin is a virtual currency that is essentially a digital

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computer code, but is also seen as a financial investment. Bitcoin and other cryptocurrencies belong to decentralized control forms, which are based on ownership, security verification, and cryptographic digital ledgers. The public ledger, known as blockchain, is used to store transactions that exist digitally. Due to the decentralized control of digital currency, this ledger does not require trusted financial intermediaries such as banks to verify transactions and government administrative controls [22]. After the advent of Bitcoin, “alternative coins” which use similar peer systems to verify transactions and add them to the blockchain appeared with the difference mainly in proof-of-work algorithms compared to the Bitcoin. Investors can raise funds through a method known as initial coin offerings (ICOs), and cryptocurrency developers can raise development funds by selling cryptocurrency to investors, making them participants in the project. The cryptocurrency obtained can be traded on exchanges. Benedetti and Kostovetsky [23] point out that the buying and holding returns are very high for ICO investors, indicating that the IPO is underpriced or that investors' perception of risk is very high.

Cryptocurrencies have the potential to replace legal tender. Traditionally, there exists two ways to create currency: money issued by national governments and private funds created by banks to open deposit accounts for borrowers in the lending process. Donaldson et al. [24] states that a bank may not necessarily take out legal tender and hand it over to the borrower. Instead, it can allow borrowers to create an accessible deposit account to borrow currency that may not already exist. Through this approach, banks create currency and increase the stock of currency. One function of the currency is for exchange. Bitcoin can indeed be used for exchange, but its use for commodity trading is limited and only accounts for a small portion of the total expenditure. In addition, the initial Bitcoin transaction was a peer-to-peer payment system, but due to cost and time constraints, later Bitcoin transactions between the two involved the conversion of real currency. Another disadvantage of Bitcoin is that its value is unstable compared to fiat currency. For example, under a 2% inflation target, the US dollar loses 2% of its purchasing power annually, while Bitcoin's value fluctuates much more [25]. And hacking, theft, and other security issues have exacerbated these difficulties. The owners must keep it in a digital wallet without “deposit insurance,” which is not currently a useful accounting unit because because its value is unstable. Therefore, viewing Bitcoin as an investment may be more appropriate. As Merton [26] points out, only the legal tender currency has intrinsic value, and only the digital currency controlled by the government can be the fiat tender.

This leads to the concept of the central bank’s digital currency, which is, the fiat tender itself will become a digital currency. The central bank’s digital currency meets the demand for current assets, which have no counterparty risk, no trouble of low cash efficiency, and are relatively safe. In addition, central bank digital currencies allow for a more flexible monetary policy, because negative interest rates are possible, and for cash, they are difficult.

The mechanism of central bank digital currency allows families and businesses to open accounts with the central bank and use the central bank's digital currency to replace commercial bank deposits for payment. Banks can still create deposits during the loan process and become a source of digital currency deposits for the central bank, pay interest rates higher than those paid by the central bank for these currencies. The central bank's digital currency can better constrain commercial banks. Due to some preferential policies offered by the central bank, families and businesses will require banks to increase deposit interest rates, conduct better capital and risk management, and enhance security [25]; The central bank's digital currency can bring about loose monetary policy. The interest paid by the central bank for household deposits can become a monetary policy tool, thereby reduce management costs. The current system can be transformed into a new one under the influence of the central bank's digital currency.

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4. One Main Technology Used In Fintech And Banking

A new form of contract called "smart contract" has emerged due to blockchain technology based on decentralized consensus and tamper proof algorithms. Smart contracts allow untrusted agents to collaborate with them without intermediaries, meaning that smart contracts can replace trustworthy intermediaries such as banks. It can also be considered as a “machine solution” that builds trust. The OECD description of this phenomenon is as follows: “ no trust transfer technology is very interesting, it is likely to become many financial intermediaries in the future disruptive technology, eliminate the idea of financial trusted third party is revolutionary — financial world has never faced such technology innovation, it questioned the needs of intermediaries and their huge share in the economy.”

Smart contracts can improve efficiency, reduce signing and verification costs. It eliminates the need for account reconciliation between trading parties and accelerates transaction settlement. At first glance, smart contracts seem to be an imminent threat to banks and other financial intermediaries, taking away a large part of their profitability if they are taken down upon as a trusted third party in their contracts. However, if banks are expected to adapt and become smart contract providers, they will use smart contracts to modify existing contracts or create new ones, as they did when dealing with the negative impact of securitization on traditional bank deposit financing models. In addition, Merton [26] noted that even smart contracts represent opacity mechanisms embedded in contracts, which may be accepted when customers trust counterparties, meaning there is no need for them to check the content of the smart contract code and the motivation of the smart contract program writers, and the influences of the contractual relationship. Without this trust, the opacity of the data collected by smart contracts and the way it is used will make customers reluctant to accept the data, and another obstacle could be privacy issues.

5. Conclusion

This review reviews research on the impact of fintech on banking, Taking P2P lending, cryptocurrencies, and smart contracts as examples, it discuss the impact of fintech on credit, deposit and financing services, payment, clearing and settlement services, and investment management services, conclude that P2P loans will not soon replace banks. But when the banks are subject to capital constraints, it would take some market share from the banks. If market lenders make significant progress in P2P lending, banks are likely to develop their own services, purchase other platforms or cooperate with existing P2P platforms. To make precautions against a sharp reduction in loans, with the deposit insurance policy, banks’ unique deposit channels will continue to bring advantages to banks. Cryptocurrencies and their derived central bank digital currencies have many advantages, could become a substitute for cash. Blockchain technology has made smart contracts appear, it has advantages in some ways, which could be a change in the existing financial contracts and in the banking industries.

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