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THE ROLE OF FINANCIAL TECHNOLOGY AND THEIR EFFECT ON BANKING

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Resumen: Una de las tendencias más calientes entre los inversores en 2016 es FinTech relacionados con las empresas. Financial Technology (FinTech) es una industria en la que pequeñas y medianas empresas jóvenes utilizan las últimas tecnologías para crear productos innovadores en un sector tan conservador como la industria financiera. Desde su ascenso en 2008, FinTech ha estado interrumpiendo el sector bancario, reformando los negocios, y transformando la manera en que los consumidores manejan y usan el dinero. FinTech es, de hecho, un segmento de la llamada interrupción digital creando nuevos modelos financieros: la gama de servicios ofrecidos por FinTech ya es amplia e incluye pagos, monedas virtuales, gestión de la riqueza, peer-to-peer (P2P) préstamos y crowdfunding. Es una verdadera revolución financiera que ve un número creciente de startups interrumpir el poder incontestable de los bancos. La inversión en FinTech se disparó de \$ 930 millones en 2008 a \$ 12 mil millones en 2014; desde entonces, los números se han disparado más y se prevé para impulsar aún más. Si bien la facilidad de uso se considera como el principal punto de venta de FinTech, es una falta de conciencia de su existencia que es el principal impedimento para su adopción - la mayoría de los usuarios no-FinTech afirman que no saben que existen. Además de definir lo que FinTech es y qué tipo de servicios y productos que ofrecen, las razones de su popularidad y su relación con los bancos también se presentan en este artículo.

Palabra clave: FINTECH, Tecnología

Abstract: One of the hottest trends among investors in 2016 is FinTech related ventures. Financial Technology (FinTech) is an industry where small to medium young companies utilize latest technologies to create innovative products in such a conservative sector as the financial industry. Since its rise in 2008, FinTech has been disrupting the banking industry, reshaping businesses, and transforming the way consumers manage and use money. FinTech is, in fact, a segment of the so-called digital disruption creating new financial models: the range of services offered by FinTech is already broad and includes payments, virtual currencies, wealth management, peer-to-peer (“P2P”) lending and crowd funding. It is a real financial revolution that sees an increasing number of startups disrupting the uncontested power of banks. Investment in FinTech skyrocketed from \$930 million in 2008 to \$12 billion in 2014; since then, the numbers have soared more and it is predicted to boost even further. While ease of use is considered as FinTech’s main selling point, it’s a lack of awareness of their existence that is the main impediment to its adoption – the majority of non-FinTech users claim they don’t know such products exist. In addition to defining what FinTech is and what kind of services and products they provide, the reasons for their popularity and their relationship with banks are also presented in this article.

Keyword: FINTECH, Technology

1. INTRODUCTION

One of the relatively new issues in economy which is in close relation with the startups is known as “investments in modern financial technology” or simply the “Financial Technology”, shortly known as FinTech. FinTech refers to the use of software and digital platforms to deliver financial services to consumers. The National Digital Research Center in Dublin, Ireland also defines it simply as *innovation in financial services* [3, 8]. More specifically, FinTech companies often use technology to disrupt incumbent financial systems. These digital tools often disrupt established business models by creating new and efficient means of providing services (Danylo, I, 2016). FinTech is, in fact, an industry in the economy which refers to companies that try to make financial services more efficient through applying new technologies. Active companies in this area are generally startups that provide customers with services such as payments, financing and lending, retail banking services, investments, insurance and wealth and asset management and try to find their way through the robust traditional financial system and make a challenging environment for traditional banks and financial institutions.

Today, a new generation of startups is evolving with the aim of penetrating the heart of financial industry; according to Accenture’s statistics (FinTech Startup Innovation & Big Data Tsunami Ahead), Global investment in FinTech ventures grew from \$4.05 billion in 2013 to \$12.2 billion in 2014. Overall spending on FinTech firms grew by more than three times the rate of general venture capital investment. Given the dramatic changes occurring in financial

services, driven by new technology, regulations, consumer behavior, and the need for cost reduction, this global trend is expected to continue for the foreseeable future. According to the estimations, it is predicted that the amount of investment grow to up to \$8 billion by 2018 (FinTech Startup Innovation & Big Data Tsunami Ahead). The number of FinTech companies has also grown by 26 percent year-over-year and this trend is growing even more.

1.1. The Evolution of FinTech

Fintech is a very broad sector with a long history. Most people hear fintech and think about the latest mobile app which can help them pay for their morning coffee without ever swiping a card or touching currency. But technology has always played a key role in the financial sector in ways that most people take for granted and might not ever see. In examining the timeline of fintech developments, the last 65 years paint a picture of continued innovation and evolution [9].

The 1950s brought us credit cards to ease the burden of carrying cash. The 1960s brought ATMs to replace tellers and branches. In the 1970s, electronic stock trading began on exchange trading floors. The 1980s saw the rise of bank mainframe computers and more sophisticated data and record-keeping systems. In the 1990s, the Internet and e-commerce business models flourished. The result was the introduction of online stock brokerage websites aimed at retail investors, replacing the phone-driven retail stock brokering model.

These five decades of developments have created a financial technology infrastructure which most people never think about, but use almost every day.

It's also important to note that throughout that 50 year period, fintech developments were also creating more sophisticated risk management, trade processing, treasury management and data analysis tools at the institutional level for banks and financial services firms. While these systems are not apparent to retail banking customers, they make up a multibillion industry aimed at supporting the needs of the financial services sector.

1.2. Why FinTech Companies?

Banks are risk averse in nature, but regarding the recent financial crises and innovations of FinTech startups, if they still want to be standing, they inevitably shall be seeking innovation in banking. The customers seek for integrated and simple digital experience. If this desire is fulfilled, that will lead to customers' satisfaction and loyalty; if not, the number of new customers and applications for new accounts will decrease and the possibility of losing the current customers and relations will be probably very high. The most important point in customers' digital experience is the smart interaction through careful analysis and advanced studies (Dubovoy, I. 2015). Paying attention to this point will not only result in attracting new customers and providing them with their required services, but is also considered among the strengths of the FinTech companies which has resulted in their dominance in the market. Among the other strengths of the FinTech companies include:

1. Paying attention to customers' needs

FinTech companies have – far better than traditional banks – realized the importance of the customers; they have understood that these are the customers who will make the final decision and what they are looking for is high quality services customized according to their needs and wants. So, they keep providing their customers with a bunch of services tailored to their desires. Enjoying High Internet and mobile penetration People in developed countries, especially those of Y generation, are eager for digital and mobile solutions for their everyday activities. FinTech innovations provide them with flexibility, increased free time and more convenient customer experience.

2. Large e-commerce systems with Internet companies focused on payments

Such giants as eBay and Aliexpress have supported the growth of PayPal and AliPay, that became big competitors for banking payments, especially in China.

3. Decreasing banking services costs

Today there is more than 2 billion of unbanked population. For some people regular banking is too expensive and mobile financial services provide cheap remote access to accounts, savings and loans, which can also lead to overall economic growth.

4. Implementing cutting-edge technologies

Latest technologies allow us to make banking more efficient, more personal, cheaper and easier to access. Development of Big Data science and analysis, internet coverage, Machine learning and AI, biometrical technologies, FinTech block chain, quantum computing, even VR and AR will completely change financial institutions from as we know them now.

No doubt banks are strongly affected by FinTech expansion and it's only the beginning. For now FinTech digitalization successfully replaces physical assets of banks. Nordic banks have already halved branches since 2008-2009. A number of full-time staff is also constantly decreasing. On the other hand, the strong position of Nordic banks could also be an obstacle for innovations. Not seeing major competition from FinTech players could cause significant loss of opportunities and slower client acquisition.

Today banks are changing under the influence of new technologies and innovative finance market players. Some banks are acquiring FinTech startups to enhance their services. Some invest in young companies or create own startup accelerators to support new technologies and benefit from them. Biggest banks such as Bank of America, Citigroup, Goldman Sachs, JPMorgan Chase, Morgan Stanley, and Wells Fargo have made significant investments in 30 FinTech companies since 2009, according to CB Insights data. And some banks created strong R&D departments to produce their own solutions to take part in modern innovations marathon.

How will the FinTech Companies Change the Financial Industry

The FinTech firms are not about to kill off traditional banks. The upstarts are still tiny: Lending Club has arranged \$9 billion in loans through its marketplace, small change compared with \$885 billion of total credit-card debt in America. They have yet to be properly tested in a downturn. No FinTech product comes close to matching the convenience and security of a current account at a bank. And banks will gain from many of the innovations. Square, for instance, is a system that makes it easier for small businesses to take card payments; it will boost banks' transaction volumes. Nonetheless, the FinTech revolution will reshape finance—and improve it—in three fundamental ways (Martin, A. 2016).

First, the FinTech disrupters will cut costs and improve the quality of financial services. They are unburdened by regulators, legacy IT systems, branch networks—or the need to protect existing businesses. Lending Club's ongoing expenses as a share of its outstanding loan balance is about 2%; the equivalent for conventional lenders is 5-7%. That means it can offer better deals to the borrowers and lenders who congregate on its platform. Half of the loan

applications Funding Circle gets from small businesses arrive outside normal business hours. TransferWise takes a machete to the hefty fees that banks levy to send money across borders.

Second, the insurgents have clever new ways of assessing risk. The likes of Kabbage and OnDeck Hoover up information, on everything from social-media reviews to companies' usage of logistics firms, to assess how well small businesses are doing. Avant uses machine learning to underwrite consumers whose credit scores were damaged during the financial crisis. Kickstarter uses the wisdom of crowds to finance startups.

This kind of data-driven lending has clear advantages over decisions based on a single credit score or meetings between banker and client. Humans are more prejudiced than algorithms: Italian banks charge female owners of small businesses more than male owners, even though the women have lower failure rates. The cost of relationship lending encourages bankers to chase big customers rather than small ones. For young businesses and borrowers on the fringes of the banking system, risk assessment that scours the online world for information is better than a loan officer in a branch.

Third, the FinTech newcomers will create a more diverse, and hence stable, credit landscape. The business of internet-based firms is less geographically concentrated than that of bricks-and-mortar lenders: small American banks already use lending platforms to diversify their own portfolios. More important, the FinTech firms avoid the two basic risks inherent in banking: mismatched maturities and leverage. Banks take in short-term liabilities such as deposits and turn them into long-term assets such as mortgages. FinTech lenders like Lending Club, Prosper and Zopa simply match borrowers and savers directly. Banks borrow heavily to fund lending; the new platforms do not. Instead, a lender commits its money until the final payment is due and it bears the risk of default.

1.3. FinTech Startups in the World and in Iran

According to A recent report from Accenture, global investment in financial technology increased more than twelve fold from \$930 million in 2008 to more than \$12 billion in 2014 (FinTech Startup Innovation & Big Data Tsunami Ahead). Forty percent of the City of London's workforce is employed in financial and technology services. In the United States, there are a numerous FinTech start-ups, including several of the best-known companies, such as Money.Net, Betterment, Lending Club, Behalf, Prosper, SoFi, Square, and Stripe.

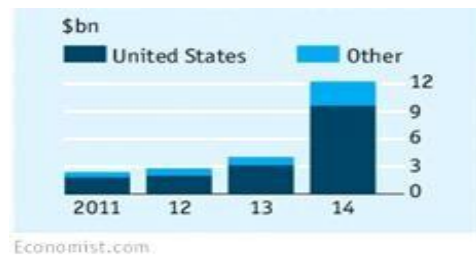


Figure. 1. Global fintech investment

Europe is not falling behind, in Europe, \$1.5 billion was invested in financial technology companies in 2014, with London-based companies receiving \$539 million, Amsterdam-based companies \$306 million, and Stockholm-based companies receiving \$266 million in investment. After London, Stockholm is the second highest funded city in the EU in the past 10 years.

In the Asia Pacific region, the growth will see a new financial technology hub to be opened in Sydney, Australia, in April 2015. There is already a number of strong financial technology players like Tyro Payments, Nimble, Stockspot, Pocketbook and Society One in the market and the new hub will help further accelerate the growth of the sector. A financial technology innovation lab is also being launched in Hong Kong to help foster innovation in financial services using technology.

Within the academic community, on the technology side the Financial Data Science Association (FDSA) was founded with its first event organized by members from the artificial intelligence, machine learning, and natural language processing domain. The FDSA aims to build a research community around computer science and investment statistics. On the business side, Wharton FinTech was founded at the Wharton School of the University of Pennsylvania in October 2014 with the objective of connecting academics, innovators, investors, and other thought leaders within the FinTech industry to each other and to the ideas that are reinventing global financial services. The University of Hong Kong Law School in conjunction with the University of New South Wales have also published a research paper tracing back the evolution of FinTech and its regulation. The following picture illustrates the FinTech companies across the globe based on the type of products and services they provide their customers with (Dubovoy, I. 2015):



Figure 2. The fitness ecosystem

FinTech startups have also initiated their activities in Iran for a couple of years; companies such as *Finnova* (FinTech Innovation Nova), *Fanap*, *Fundoran* and *Win Win* are among the FinTech startups active in Iran. Fundoran is a crowd funding platform in which those who are active in areas such as arts, IT, product design, social affairs and charities or have innovative ideas can call out for a campaign and will start collecting the financial supports of Fundoran fans. ‘Win Win’ is also a collection of mobile payment solutions which provide its customers with safe, quick, easy and user-friendly payment solutions. Win Win is highly supported by Fanap and uses Pasargad E-Payment gateway for its transactions.

1.4. Services Provided by FinTechs

FinTech is revolutionizing the way we pay for goods and services, transfer money between accounts and send it overseas. According to the survey conducted by Ernst & Young Global Limited in 2015 among more than 10,000 digitally active people in Australia, Canada, Hong Kong, Singapore, the United Kingdom and the United States (Desai, F. 2015), these three activities are the most-used FinTech services, and are followed closely by savings and investment products such as online stockbroking/ spread betting, online budgeting/planning, online investments, equity and rewards crowd funding and peer-to-peer or marketplace lending.

From crowdsourcing to mobile payments, there has never been as much choice to entrepreneurs as there is presently. It’s never been cheaper to not only set-up your business, but also to expand it.

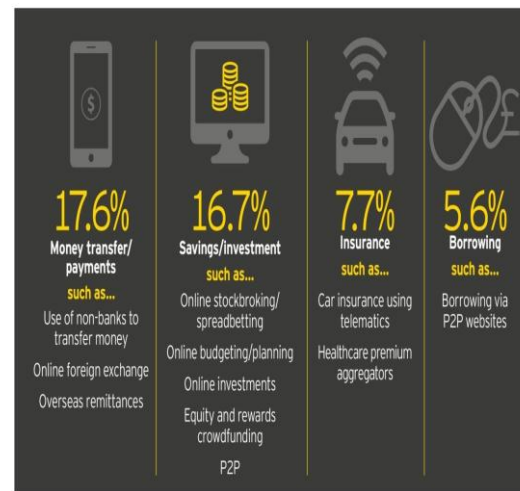
Crowdsourcing, for example, allows people with big ideas to get funding quickly and easily from anywhere in the world from people they have never entrepreneur’s lives since time immemorial is another area that is being reworked and reframed by innovators. Transfer Wise has turned the traditional (and expensive) banking solution to sending money

While they do exist, health insurance premium aggregators, car insurance telematics and peer-to-peer online borrowing websites are among the less commonly used services (Desai, F. 2015).

1.5. Percentage of Digitally Active Customers Using Each Product

In general, areas of the most intensive FinTech innovation include (Dubovoy, I. 2015):

- Online/mobile payments
- Money transfers
- P2P Lending, Crowd funding
- Asset Management and Wealth
- Insurance (Insur -Tech)
- Investments (Robo-advisors)
- Digital Security
- Big Data Analytics
- Digital Currency and other Block chain technologies



Percentage of digitally active customers who have used each product.

Fig 3. Percentage of digitally active customers who have used each product

met. Instead of months of investor talks, entrepreneurs can – thanks to the shop-window that is the internet – pitch directly to the world. Those with the magic touch can see the funds roll in within a matter of weeks rather than months.

Transferring money across borders, a bane of across borders on its head and enables small firms and individuals to transfer money far cheaper than was previously possible.

The above are just a couple of the many ways in which FinTech has made it easier to do business and lower costs. FinTech firms can pass on huge savings as they are far more agile than traditional banks, not having the same overheads and commitment banks are blessed (and burdened) with. Their relative lack of size also allows them to innovate and adapt in a way bigger corporations can only dream of.

In addition to the above-mentioned points, below is listed the 7 intriguing areas of focus for financial companies, and how they're making an impact (Munch, J. 2017):

1. **Cloud computing:** This technology is enabling new computing architectures and can contribute greatly to productivity, as well as address compliance, security and legal concerns attached to public cloud offerings.
2. **Block chain technology:** This may have the potential to significantly improve transparency and may even reduce costs. There may be as many as 1,000 new startups already working in this space.
3. **Big data and deep analytics:** These technologies are especially useful when they enable self-service visualizations and the discovery of non-intuitive insight. Artificial intelligence systems will play a big role in future developments.

1.6. The Main Reasons for Using FinTech Services

The relative ease in setting up an account was overwhelmingly cited by respondents in the above-mentioned survey as the top reason for using FinTech. More attractive rates, access to different products and services and a better online experience were also popular responses; but it is the simplicity involved in using FinTech products and services that is driving adoption (Desai, F. 2015).

While many traditional providers are grappling with how to replace cumbersome, outdated and time-consuming account establishment forms and processes, FinTechs are enabling customers to set up services with as little as one click.

Other main reasons for using FinTech products and services are demonstrated in the following graph:

4. **Personalization:** Every customer interaction delivers a common experience and unlocks the nuances of every individual's specific financial needs.

5. **The future of the mainframe and highly optimized transaction processes systems:** These continue to help differentiate a company's offerings.

6. **New paradigms in personal computing:** The Apple Watch and Oculus Rift are two examples, both of which enable new customer behavior models and ways for consumers to more actively interact with and manage their financial resources.

7. **Hyper-converged systems:** Through these systems, storage, commodity computing and network components merge in highly integrated ways. For instance, Fidelity is a member of Open Compute, a hardware community set up by Facebook to allow for more cross-industry collaboration across a variety of areas. Developers will be able to program the infrastructure into their applications; it will all be about software.

Modern technologies are creating unprecedented growth opportunities in the financial services industry — and the trend of innovation is only on the rise. Companies seeking to capitalize should keep a close eye on the above trends.

8.



Figure 4. Top Seven Reasons for using FinTech

2. TOP SEVEN REASONS FOR USING FINTECH

2.1. The Main Obstacles for NOT Using FinTech Services

While ease of use remains FinTech's key selling point, it's a lack of awareness that is the main impediment to its adoption – the majority of non-FinTech users claim they don't know such products exist. Other respondents feel they don't need the products or they prefer traditional financial services providers (Desai, F. 2015).

Interestingly, trust has not been a major obstacle to FinTech use, with only 11.2% of respondents saying they don't trust FinTech products. Other main obstacles for not using FinTech products and services are demonstrated in the following graph:

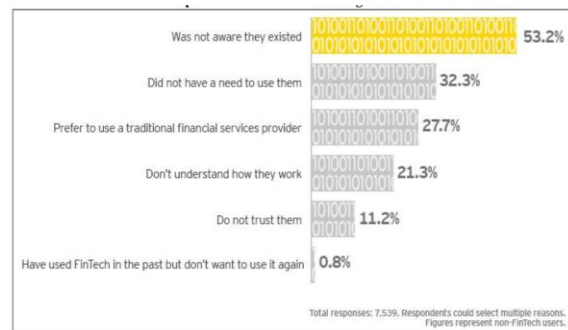


Figure 5. Top Six Reasons for NOT Using FinTech

3. CONCLUSION

The rapid global revolution in technology in recent years has greatly influenced the banking systems all over the world and has elevated the necessity for innovation in financial services much more than ever before. On one hand, the digital revolution can reduce the role and importance of traditional banks; and on the other, it can help them provide their customers with better, faster and cheaper services.

The question then becomes, what is the nature of the relationship between banks and FinTech startups in 2016? Is it one of competition or cooperation? Are the banks in trouble, or are they too powerful to be toppled by these new companies with much fewer resources at their disposal?

One thing that is clear about the current market is that FinTech startups could not exist without banks. Since the vast majority of consumers use banks to facilitate a major overhaul in the way banks have traditionally operated (Danylo, I, 2016).

This is where FinTech comes in. It's no secret that FinTech startups are often on the cutting edge of new ways to utilize consumers' financial information. There's a reason these startups are proving to be such a disruptive force in the financial sector, and it's mainly because they have found ways to analyze users' information in a way that provides crucial insight that consumers can use for their own financial planning and decision making. Data analytics is the number one driver of financial innovation, and startups more so than banks have been on the cutting edge of using cloud-based data services to provide more personal financial insight than ever.

With this understanding of the relationship between FinTech and banking institutions, perhaps it makes sense to refocus the perspective as we look forward to the industry's progression in 2016. Maybe disruption and competition aren't the correct terms and instead we can view it as a relationship of competitive cooperation. The proliferation of

store their money, almost all services currently offered by FinTech companies rely on financial information about users that only the banks have access to. Many FinTech companies, however, have cutting-edge technology that banks don't have (e.g., algorithms to read and identify types of purchases in order to automatically generate a monthly budget), and this competitive advantage keeps them in the game (Danylo, I, 2016). In the current climate, then, it seems that there's much more of a give-and-take relationship between FinTech and banks; one that both institutions would be wise to capitalize upon.

Should the banks decide to leverage their competitive advantage (namely, access to consumers' financial information) against FinTech startups, it could mean big trouble for these new companies, which lack the resources or household name recognition to seriously compete without this information. This leveraging would, however, require a pretty serious investment of time and resources on the banks' part and might FinTech startups will only continue so long as these companies have access to information that the banks hold (or until they gain that access themselves and become household names as big as banks), while banks will continue to rely on FinTech startups to supplement their own offerings and provide the technological innovation to move the industry forward. In this way, banks and financial institutes can not only attract the satisfaction of customers, but also reduce costs, improve profitability and manage their risks (Danylo, I, 2016).

Banking system in Iran is not an exception either. Now that the sixth Development Plan emphasizes on innovation and financial tools development, the banking industry activists shall try to prepare the necessary requirements for the growth and development of banking startups and fulfill their customers' wants and wishes by providing them with safe, modern, transparent, quick and cost-saving services. Providing customers with technology-based products and services or employing strategies such as focusing on untapped markets, FinTech startups can

transform different aspects of financial industry such as investment, payment and lending.

However, prior to this collaboration between banks and FinTechs, there are a couple of obstacles – including the cultural difference between these two, their different responsibilities against their shareholders and the resulted expectations – that need to be removed. Furthermore, making these two different methodologies compatible and close to each other is also another important concern that needs to be addressed

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