

MANAGING CHANGES ON BANK SERVICES AND PERFORMANCE BY ADAPTING FINANCIAL TECHNOLOGY (FINTECH): A CASE OF THE MACEDONIAN BANKING SYSTEM

Artina Bedjeti Baftijari¹, Leonid Nakov¹, Aida Yzeiri Baftijari²

¹Faculty of Economics, Ss. Cyril and Methodius University, Skopje, North Macedonia

¹Faculty of Economics, Ss. Cyril and Methodius University, Skopje, North Macedonia

²Faculty of Economics, University of Tetova, Tetovo, North Macedonia

*Corresponding Author: artinabexheti@hotmail.com

Abstract

The development of financial technology (*Fintech*) imposes a challenge for traditional financial institutions. Therefore, it is important to analyze how financial technologies can change and affect banks' performance. The aim and objective of this research are to analyze the possibilities for the development of financial technology, manage and adapt the changes that appear, qualitatively and quantitatively evaluate its impact on the banking sector's performance in North Macedonia.

After the analysis of the academic literature and statistical data, experts' evaluation method is used to identify the development opportunities of *Fintech* in North Macedonia and correlation-regression analysis was applied to evaluate the impact of *Fintech indicators* on the performance of the Macedonian banking sector.

According to the results of the experts' assessment survey, North Macedonia possesses favorable conditions for *Fintech* enterprises to enter the Macedonian financial market in the next decade. Correlation-regression analysis showed that *Fintech indicators* influence the banking sector's performance, but the effect is not very strong.

The impact of *Fintech* in North Macedonia is a new area and so far, very little research. So, the obtained results will expand the scope of the research and would be useful and relevant on (i) how the government sector should manage changes, risks and ensure stability in the financial system; (ii) the way financial institutions can monitor possible developments and risks and manage them; accordingly, and (iii) the banking sector should analyze the impact of technology and *Fintech* new entities on them and take strategic decisions in this regard.

Keywords: Fintech, managing changes, banking services, bank performance, North Macedonia

1. Introduction

Recently, most of the economic activities around the world are becoming highly digital. In the past several years, changes in financial innovations and technological improvements have had a huge impact on the modern financial system. Globally, the banking system has changed and integrated financial technology (Fintech) into its daily routine. Today, for some financial members, Fintech poses a major challenge and threat to traditional banking, while for some others it provides an opportunity for better functionality, greater flexibility, and higher service quality.

The combination of the words "financial" and "technology" gives the so-called world-known word Fintech, which is associated with financial innovations, changes in the way financial institutions provide - while consumers and businesses use the financial services.

Although Fintech is relatively a new term nowadays, innovation has always been an important part of the financial system. The key difference between them is the impact and pace of change. This trend has prompted us to develop the initiative of the "Future of Finance", which explores how the financial system can change in the next period and what are our priorities today and in the future.

The role of financial technology (hereinafter referred to as Fintech) has shown great importance in the 21st century with the rapid development of information technology. The great applicability of Fintech has a positive effect on the financial sector, increases the efficiency of the financial system, and contributes to the growth of the country's economy. The growing opportunities for the application of new technologies in the financial sector have imposed the growth of Fintech companies as a new type of entity all over the world. Although traditional banks are key players in the financial sector (Lévy-Bencheton, 2016), it is increasingly argued that the growing Fintech sector can take a position as a major provider of financial services (Dabrowski, 2017).

According to De Young (2005), the applicability of technologies and the development of new channels for providing financial services and changes in their management are considered as an indicator of increasing the performance of banks. On the other hand, there are facts that in some countries technological changes can reduce the profit of banks (Tunay et al, 2015), or will affect their efficiency only partially. In response to the emergence of Fintech, banks are trying to upgrade the financial services they provide, especially because of the new competitors that are emerging in the financial sector and can negatively affect the performance of banks (Dabrowski, 2017). However, researcher's efforts into the possibilities of how financial technologies will advance, and how Fintech entities will operate in the marketplace, are still very much unknown (Titko, 2015). Therefore, it is becoming increasingly important to analyze the Fintech sector, especially given that the research literature has not yet reached a concrete conclusion about the impact of financial technologies on the performance of banks.

The scientific problem presented in this research is compounded by the lack of evidence for the potential emergence of the Fintech sector, the development of financial technology in North Macedonia, and the impact that this would have on the performance of the banking sector. Given this situation, the main research question is whether there is a favorable environment for the development of Fintech in North Macedonia and whether the development of financial technology would have a significant impact on the banking sector in the country.

The purpose of this paper is to try to analyze the opportunities for the development of the financial technology sector and to produce a quantitative assessment of its impact on the banking sector's performance in the country. Additionally, we include a theoretical analysis of the correlation between financial technologies and the banking sector performance, together with the qualitative and quantitative assessments of the impact of financial technologies on the efficiency of the Macedonian banking sector.

2. Literature review

Financial innovations are usually associated with the development of new financial products and can be interpreted as new changes in the financial system (Blach, 2011). Zovolokina et al. (2016) mentions Fintech as a "connection" between the financial and technology sectors, while Bruggink et al. (2017) considers Fintech to be the presence of technologies that improve the financial sector. Zovolokina et al. (2016) identified a number of functions for the application of financial technologies: development of new services, upgrading the current services and thus reducing

prices, development of new business models to promote competitiveness. Arner et al. (2015) defines financial technologies as technologies that are used to implement financial solutions. Such identification of Fintech features conclude that it focuses on the development of new services, processes and products designed to meet existing and new consumer needs. According to Blach (2011) Fintech performs a number of functions, such as increasing liquidity, increasing financing and lending opportunities, improving investment opportunities and managing risks.

Several key factors that promote the development of Fintech are: technology, regulation, macroeconomic environment and ecosystem (Schindler, 2016) as well as the change in consumer perception and behavior (Puchmann, 2016). Changes in consumer preferences encourage the introduction of new financial products. In other words, the "innovation spiral" is called the Fintech factor, a process that means that when a new innovation emerges, it triggers another innovation (Shindler, 2016). Fintech is focused on innovations in financial services mostly promoted by new entrants in the financial sector, mainly due to the favorable conditions. Such participants include Fintech companies that focus on specific areas of activity or include several areas of e-commerce. However, traditional financial institutions also want to apply Fintech innovations and compete with the new companies. References define the following areas of activity for new Fintech participants: payment, asset management, lending, co-financing, insurance services, and capital markets (Shindler, 2016).

The introduction of new business models in the financial sector expands the financial spectrum and shows the extent to which the sector can adapt to the changing needs and preferences of consumers by offering better services and new financial needs. However, the emerging business models are increasing the number of new entities in the financial sector, which significantly increases competition for traditional financial institutions that have enjoyed the largest market share up to now. Changes in the financial sector require an analysis of the potential development in the sector and whether traditional financial institutions will be replaced by new members.

Most of the first innovations promoted by the development of technologies that marked the beginning of the Fintech era were applied in the banking sector. As a result of such innovations, the traditional banking sector has undergone a number of changes, ranging from the check system used, ATMs, electronic cards, electronic payments, online banking, mobile banking and digital banking (Wonglimpiyarat, 2017). Some of the changes are initiated by the banks themselves (Puschmann, 2017). The application of technologies in the banking sector has only strengthened the banks and opened new ways for further enlargement of their activities and increasing their efficiency (Bratanu, 2017), also promoting new services and products, while reducing operational costs.

Tunay et al. (2015) concluded that the introduction of internet banking has increased the performance of banks. However, DeYoung (2005) noted that it would be more reasonable for banks to maintain a balance between traditional banking and Fintech services, as customer demand would always arise and change from different channels. Research by Bratanu (2017) concluded that financial technologies help banks to maintain better and stronger relationships with their customers. While according to Sadr (2013) innovative payment services have a positive impact on the performance of the banking sector.

On the other hand, changes in the financial world have encouraged the way for new entities in the Fintech sector (Lévy-Bencheton, 2016), so that Fintech companies have now become quite a big challenge for traditional banks. Using new technologies, Fintech companies offer more efficient ways and methods for existing services and products, and thus are more competitive for banks (Wonglimpiyarat, 2017). In terms of their operating models, Fintech companies are like

banks and focus mainly on payment operations and lending (KPMG, 2017), which is the main area of tasks and source of profit for banks. Thus, there is a growing perception that these new actors in the financial sector will become major competitors for banks (Lévy-Bencheton, 2016). Beard (2018) argues that the entry of Fintech companies into the global market could reduce the revenues of the banks by about 10-40 percent by 2025. However, Sokrin (2016) sees two possible scenarios: first, Fintech's impact on the banking sector will be negative in terms of performance, or second, Fintech will not have a significant impact because the banking system is too powerful and the new members in the sector cannot compete with them. Furthermore, Bratananu (2017) pointed out that banks and Fintech companies can not only compete but also can work together to improve the traditional way of banking.

Although most of the research papers on Fintech are theoretical rather than empirical in nature (Schindler, 2016), they provide definitions of financial technologies, work models and development stages, analyze existing regulations and the impact of technologies and the emergence of risks. However, in terms of further development of the Fintech sector, other areas have also attracted the interest of researchers, focusing more on the level of development of the country's financial technology, the impact of the sector on the countries' economy, the financial sector, or opportunities for further development of the Fintech sector. For example, Vargas (2008) found that banks incorporate financial technologies less than Fintech companies, but their role still remains increasingly important, and banks are likely to rise their use of financial technology in the future. While analyzing innovations in the field of banking, Tunay et al. (2015) concluded that Fintech technologies had a positive effect on banks. However, a study conducted by Trivedi (2015) showed that the impact of innovation and their potential to affect the performance of traditional banks is not still very clear, because such technologies have an impact on both the performance and the stability of banks' operations. From the above-mentioned conclusions, it is important to analyze whether the Fintech sector has a significant impact on the financial system.

3. Methodology and results

According to various researchers, collecting information about the Fintech sector is a rather complex procedure, therefore, surveying experts was defined as the most effective method for assessing this aspect. However, this method requires special expertise and professional background that is possessed by only a limited number of experts. Thus, experts' evaluations can be used in situations where information is insufficient (Keliuotytė-Staniulėnienė et al., 2019). Therefore, in this research, the method of expert evaluation via a survey was conducted to analyze the opportunities for the development of the financial technology sector in North Macedonia. The method is used to obtain and collect information about the Fintech sector, the factors that affect it, the occurrence of possible problems, and the overall development of this sector in the country.

There are various limitations within expert evaluation models. In this case, the opinion of six experts was analyzed for this study. Several criteria were selected for the selection of experts, such as their professional background and position (executive position in the company - strategic manager, director, etc.); higher university education (master's degree in areas related to business development, economics, finance, and technology); and professional experience in financial technologies (more than 3 years). The questionnaire is based on previous research conducted by companies such as PwC and Deloitte that aimed to assess the Fintech potential globally (Gimpel, 2015). The survey consists of 15 questions: five closed questions and ten open questions (Appendix 1).

The results of experts' opinion:

The questionnaire was conducted in November and December 2020. From the initial obtained experts' results, it can be said that the society is familiar with the term Fintech and that the economic environment in the Republic of North Macedonia is assessed with an intermediate level for the introduction of new technologies in the financial sector. Thus, the environment in the country has an adequate climate for the development of Fintech companies in the future and they will have an impact on the day-to-day activities of the banking sector. Technological financial innovations will have a positive impact on the overall operation of banks and will enable more effective and efficient development of the entire financial sector, through:

- Digitalization of banking services;
- Increased quality of customer service;
- More efficient availability of services to customers;
- Reduction of transaction costs;
- Facilitating cooperation between financial institutions;
- Easier and cheaper access to economic information;
- Greater liquidity in the functioning of the financial sector.

However, the development of financial technology poses great threats, initially for the banking security itself (Cybersecurity), the emergence of electronic money, and the further growth of companies in the shadow economy.

Banks as major players in the financial sector are the most affected by the technological boom, and they must think beyond traditional financial services to remain part of this development. Also, the appearance of Fintech companies will have an impact on these institutions, and among the most affected according to experts will probably be the small commercial banks. On the other hand, the experts surveyed confirmed that the partnership between the new Fintech companies and the banks themselves would be profitable, starting only from the fact that the banks have stable assets, know-how expertise, stable infrastructure, and a large loyal customer base, while the new Fintech companies are quick to accept changes and have greater technical and innovative expertise. Thus, the cooperation would contribute to the development of new changes in the bank services and also provide stable profits.

Additionally, to analyze the impact of financial technologies on banks, researchers worldwide use the correlation-regression analysis method (Mwaura et al., 2016). For this paper, the impact of the Fintech sector on the Macedonian banking sector was assessed using linear regression analysis.

Many researchers use key indicators to assess the performance of the banking sector in their analysis, such as return on equity (ROE) and return on assets (ROA). Thus, ROA and ROE are selected as dependent variables of this research. Furthermore, based on the research from (Keliuotytė-Staniulienė et al., 2019) we selected the following independent variables for North Macedonia: number of total payment cards in circulation, the total number of post terminals and the total number of ATMs, total number of transactions with payment cards through these devices and the use of internet banking by the population.

Because the linear regression model is most suitable for projection when all variables correlate with the dependent variable and do not correlate with each other, for the study, the regression model is formed only with those independent variables that are statistically significant with the

dependent variables. For this research, secondary data taken from the quarterly reports on Payment Statistics and Financial Stability by the National Bank of the Republic of Northern Macedonia (NBRNM, 2020) and EUROSTAT are used. The Ordinary Least Square method was used in this research and the estimates are conducted through the STATA 16 software system. Descriptive statistics, correlation matrix, and diagnostic tests are also performed to confirm the authenticity of the results:

Model specification

$$ROA/ROE = \alpha + \beta_1 Cards + \beta_2 POS + \beta_3 ATM + \beta_4 Trans + \beta_5 Ebank + \varepsilon$$

Where:

ROA / ROE - Return on Assets / Return on Equity

Cards - Total number of cards in circulation;

POS - Total number of POS terminals;

ATM - Total number of ATMs;

Trans - Total number of realized transactions with payment cards through devices;

Ebank - use of internet banking.

Results

The correlation-regression analysis was performed using quarterly data from the first quarter of 2010 to the second quarter of 2020. The results of this research through the software system STATA 16 enabled the identification of the following factors that potentially support the development of financial technology in North Macedonia:

Table 1. Linear regression – ROE

Linear regression				Number of obs	42
				R-squared	0.7677
ROE	Coef.	t	P> t	[95% Conf. Intervals]	
Cards	-0,236	-2,640	0,012	-0,419	-0,054
POS	-0,942	-5,990	0,000	-1,261	-0,623
ATM	0,555	2,740	0,009	0,144	0,966
Trans	0,461	4,340	0,000	0,245	0,677
Ebank	0,320	2,720	0,010	0,081	0,559
_cons	2,281	0,900	0,372	-2,841	7,403

Source: Authors' calculations

Table 2. Linear regression - ROA

Linear regression				Number of obs	42
				R-squared	0,764
ROA	Coef.	t	P> t	[95% Conf. Intervals]	
Cards	-0,2510	-2,6100	0,0130	-0,0440	-0,0050
POS	-0,1030	-5,8300	0,0000	-0,1390	-0,0670
ATM	0,0610	2,7600	0,0090	0,0160	0,1060
Trans	0,0400	4,2800	0,0000	0,0260	0,0730
Ebank	0,0360	2,7400	0,0100	0,0090	0,0630
_cons	0,2520	0,8900	0,3780	-0,3200	0,8250

Source: Authors' calculations

Thus, according to the results of the tables presented above, all variables are statistically significant because the probability indicator (Prob) p-value is less than 0.05, t-Statistic is greater than 2 in absolute value and the coefficient of determination (R-squared) is relatively high, which indicates that 78% of the change in the dependent indicators is explained by the independent variables in the presented model. However, from the estimates, the quarterly growth rate of the total number of cards in circulation (Cards) and the quarterly growth rate of the total number of POS terminals (POS) have an unexpected negative impact on the performance of the banking industry. While the quarterly growth rate of the total number of ATMs (ATMs), the total number of transactions with payment cards through these devices (Trans), and the percentage of residents using Internet banking (Ebank) indicate an expected positive impact on the performance of the banking industry. But, although the variables are statistically significant, still their coefficients are very small, signaling a low impact on the dependent variables.

4. Conclusions

There is no consensus in the research literature on how the adoption of financial technology would affect the performance of the banking sector. In theory, financial technology at some point can either positively or negatively affect the performance of banks due to easier adaptation to new technologies and the formation of new operating management models in the financial sector. On the other hand, some of the studies suggest that financial technology does not have a significant impact on the performance of the banking sector, as banks can adapt to new technologies, also due to the rather obvious opportunities for cooperation between the two sectors. So, the issues of managing all these changes in the financial world remain open for further discussions and new opportunities for future researches.

According to the results of the assessment of the experts' in this research, the following factors were identified as potentially supporters of the development of financial technology in North Macedonia: Digitalization of banking services along with increasing the quality of changes in services would have a positive impact on society, banks and their customers. The economic environment of North Macedonia is assessed as favorable for the emergence of new Fintech companies, primarily due to highly competent employees, well-developed infrastructure and favorable conditions for business development. In addition, it can be expected that the impact of

Fintech development will contribute positively to the banking sector. On the other hand, Fintech companies tend to continue to cooperate with the banking sector, rather than compete with it.

Additionally, the quantitative assessment shows that the Fintech indicators affect the performance of the banking sector. Thus, a significant relationship was found between the indicators of performance of the banking sector and the total number of cards in circulation, the total number of Post terminals and ATMs, the total number of transactions with payment cards through devices and the use of Internet banking. However, the results show an unexpected negative impact on the total number of cards in circulation and the total number of post terminals, but their coefficients are very small, signaling low impact on the dependent variables for now.

Finally, according to the experts' evaluation and quantitative assessment of the impact of financial technologies on the Macedonian banking sector, it showed that North Macedonia has favorable management models and conditions for absorbing the technological boom over the next decade.

Appendix

Questionnaire

Part I:

1. In which sector does your profession belong?
2. In your opinion, are the employees in the sector you belong to familiar with the term Fintech (Financial Technology)?
1. YES 2.NO
3. How do you assess the economic environment in the Republic of North Macedonia for the introduction of new technologies in your sector?
1. High 2. Medium 3. Low
4. Do you think that the environment of the Republic of North Macedonia has an adequate climate for the development of Fintech companies in the future?
1. YES 2. NO 3. Maybe
5. Do you think that the establishment and operation of Fintech companies in the future will have any impact on the day-to-day activities of the banking sector?
1. YES 2. NO 3. Maybe

Part II:

1. How do the emergence of financial technology (Fintech) have an impact on the modern financial system?
2. How does technological financial innovation change the way financial institutions provide financial services? Will investing in financial innovation have a positive impact on the performance of banks - as major participants in the financial sector!
3. How can the financial system change in the next decade and what does that mean for our priorities now and in the future?

4. Which areas of the financial sector will be most affected by the emergence of Fintech companies over the next decade?
5. Do banks as part of the financial sector think beyond traditional financial services during the technology boom?
6. What are the threats related to the growth of Fintech in the banking sector?
7. What are the growth opportunities of Fintech in the banking sector?
8. Do banks and Fintech companies have anything to offer each other? Do banks need to start a partnership with Fintech companies, if they want to have a stable profit?
9. Which category of risk in banking is considered the most serious at the moment of the technology boom and why?
10. What changes in Fintech indicators would have an impact on the performance of banks? Case of the Macedonian banking system.

References

- [1]. Arner, D. W., Barberis, J., & Buckley, R. P. (2015). The evolution of Fintech: A new post-crisis paradigm. *Geo. J. Int'l L.*, 47, 1271.
- [2]. Błach, J. (2011). Financial innovations and their role in the modern financial system-identification and systematization of the problem. *e-Finanse: Financial Internet Quarterly*, 7(3), 13-26.
- [3]. Brătășanu, V. (2017). Digital innovation the new paradigm for financial services industry. *Theoretical & Applied Economics*, 24.
- [4]. Bruggink, D., & Mouilleron, E. (2017). Success factors for the deployment of financial technology: An interview with Eric Mouilleron. *Journal of Payments Strategy & Systems*, 10(4), 396-400.
- [5]. Dabrowski, M. (2017). Potential impact of financial innovation on financial services and monetary policy. *CASE Research Paper*, (488).
- [6]. DeYoung, R. (2005). The performance of Internet-based business models: Evidence from the banking industry. *The Journal of Business*, 78(3), 893-948.
- [7]. Gimpel, H., & Röglinger, M. (2015). Digital transformation: changes and chances—insights based on an empirical study.
- [8]. Keliuotytė-Staniulėnienė, G., & Smolskytė, G. (2019). Possibilities for financial technology sector development and its impact on banking sector performance in Lithuania. *Economics and Culture*, 16(1), 12-23.
- [9]. Keliuotytė-Staniulėnienė, G., & Smolskytė, G. (2019). Possibilities for financial technology sector development and its impact on banking sector performance in Lithuania. *Economics and Culture*, 16(1), 12-23.
- [10]. Lévy-Bencheton, C. (2016). *Fintech, Open Source, and Emerging Markets: Digital Banking for Everyone*. O'Reilly Media.
- [11]. Mwaura, H. W., & Nasieku, T. (2016). Factors influencing the growth of financial innovation at the Nairobi Stock Exchange. *International Journal of Social Science and Information Technology*, 520-531.
- [12]. Puschmann, T. (2017). Fintech. *Business & Information Systems Engineering*, 59(1), 69-76.
- [13]. Sadr, S. M. H. (2013). Consideration the effect of e-banking on bank performance; Case study selected Asian countries. *Journal of Economics and Sustainable Development*, 4(11), 112-117.
- [14]. Schindler, J. W. (2017). FinTech and financial innovation: Drivers and depth.
- [15]. Sorkin, A. (2016). Fintech Firms Are Taking On the Big Banks, but Can They Win. *The New York Times*, 6.
- [16]. Titko, J., Skvarciany, V., & Jurevičienė, D. (2015). Drivers of bank performance: Case of Latvia and Lithuania. *Intellectual Economics*, 9(2), 120-129.
- [17]. Tunay, K. B., Tunay, N., & Akhisar, I. (2015). Interaction between Internet banking and bank performance: The case of Europe. *Procedia-Social and Behavioral Sciences*, 195, 363-368.

- [18]. Vargas, A. R. (2008, August). Assessing the contribution of financial innovations to the production of implicit services of financial intermediation in Costa Rica. In *IFC Bulletin, Proceedings of the IFC Conference on, Measuring financial innovation and its impact* (No. 31, pp. 445-466).
- [19]. Wonglimpiyarat, J. (2017). FinTech banking industry: a systemic approach.
- [20]. Zavolokina, L., Dolata, M., & Schwabe, G. (2016). The FinTech phenomenon: antecedents of financial innovation perceived by the popular press. *Financial Innovation*, 2(1), 1-16.
- [21]. https://www.nbrm.mk/platiezhna_statistika.nspix