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DEVELOPMENT OF FINTECH SOLUTIONS IN THE MACEDONIAN BANKING SECTOR

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Abstract

Fintech is radically changing the financial landscape in the 21st century. It emerged because of three significant driving factors, the 4th Industrial revolution, the Covid-19 pandemic, and the changed needs of consumers.

Covid-19 accelerated the fintech industry's growth. The Internet of Things, artificial intelligence, augmented reality, and the cloud exerted tremendous pressure on traditional financial technologies. Embodied in advanced technology that provides better and more efficient financial services, fintech is intensively used by reformed financial institutions, start-ups, scale-ups, and unicorn companies. Consumers also benefit from the new digital financial services.

The paper analyses the trends and perspectives for fintech development of the Macedonian financial sector. Extensive empirical research was performed regarding past and current levels of the bank's digitization with a focus on legislation and the level of outsourcing of e-banking products and services as an obstacle or incentive for the development of the fintech industry.

Keywords: *bank digitization; industrial revolution; Covid-19; fintech companies; consumers*
JEL Codes: *G21, G28, O33*

1. Introduction

Fintech is an innovative, emerging market and has potential to change the world of finance. This industry is growing at an increasing rate, replacing the traditional financial techniques. Today, the fintech industry is worth approximately $180 billion and the total

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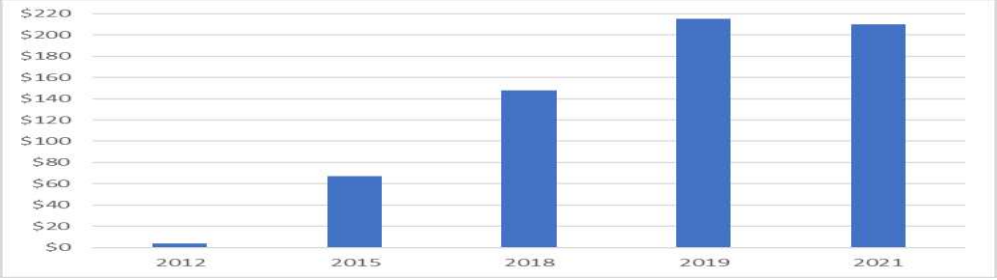
value of the global fintech market is estimated to reach $305 billion by 2025 (Globe Newswire, 2020). Global fintech industry revenue as well as the number of fintech startups has more than doubled. Hence, the revenue has grown by 97% since 2017 (when revenue was approximately $90.5 billion) and fintech startups reached over 26,000 from only around 12,000 fintech startups worldwide in 2019 (Deloitte, 2020). It is expected that global fintech revenue on average to grow by 11.7% between 2019 and 2024 (Deloitte, 2020). Fintech industry investments (see Figure 1) have also grown at a fast rate and have reached $210 billion with 5.684 deals by the end of 2021 (KPMG, 2022).

Figure no. 1 Investments in fintech industry, in $ billion



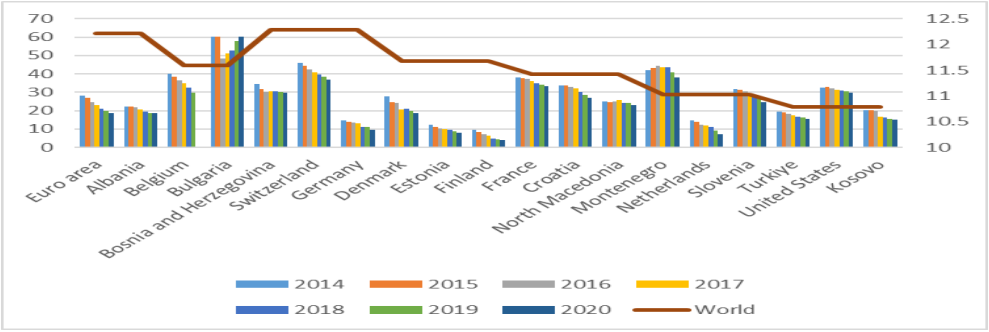
Source: KPMG (2022)

According to Statista (2022), the total cryptocurrency market capitalization reached $992 billion in September 2022, which is almost 40 times more than $25 billion in March 2017. The same source indicates that the transaction value in Crowdfunding is projected to reach $1.02 billion in 2022.

The emergence of fintech is due to three significant driving factors, the 4th information and communication revolution, the Covid-19 pandemic, and the changed needs of consumers, both individual and business. The 4th industrial revolution brought innovations, such as the Internet of Things, the cloud, augmented reality, robotics, digital products, 3D printing. By overcoming limitations in terms of time, space, and the existence of asymmetric information, through digitization, electronic financial services significantly contribute to a qualitatively higher level of efficiency, profitability, and stability in the financial markets. Traditional banks and their branches are affected mostly and are losing their comparative advantage and convenience with the emergence and development of the fintech industry. They must invest in e-banking and offer competitive financial services. They have started to make a substantial investment in new technology, particularly digital wallet solutions, biometric identification systems, and sophisticated algorithms for screening borrowers. (EBRD, 2021). The size of the bank's physical branch networks is decreasing globally, from 12.22 per 100.000 individuals in 2014 to 10.78 in 2022 (see

Figure 2), as banks face intense competition from neo banks, non-bank internet lenders, and fintech firms.

Figure no. 2 Commercial bank branches (per 100,000 adults)



Source: World Development Indicators (2022)

Pressured also by the Covid 19 pandemic, commercial banks have responded with expansion of digital infrastructure, by offering more online banking services.

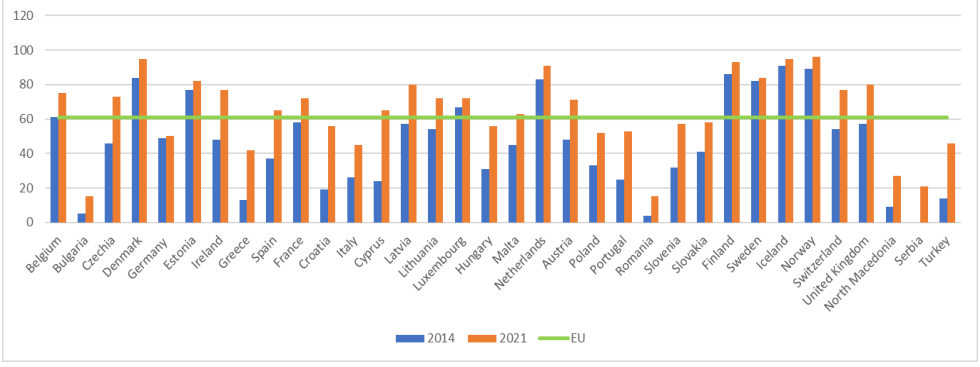
The fintech industry, which has a disruptive character for banks, gives space to non-financial institutions and companies, which are technologically advanced, to offer digital financial solutions that are not offered by commercial banks. In this respect, digital innovators such as peer-to-peer lending, digital (cashless) payment, robotic trading, robo-advice, virtual currencies, crowd-funding platforms as well as big-tech firms are becoming strong competitors to commercial banks. In ten years, PayPal accounts have almost doubled. From more than 232 million accounts registered in 2011 (of which over 100 million were active), in 2022 PayPal has 426 million active, registered accounts and is already operating in 202 markets. It allows customers to send, receive, and hold funds in 25 currencies worldwide and from 2021 allows customers to use cryptocurrencies to shop at 26 million merchants online. It also offers services not only to individuals (B2C markets) but also to legal entities (B2B markets) (PayPal's Q4-21, 2022). Furthermore, large companies for telecommunications, electricity, gas, water, etc. are increasingly introducing their own systems for electronic payment of monthly bills for electricity, telephony, internet, television, etc. With the opening of this type of online payment portal by larger corporations, the need for over-the-counter operations and the commissions that banks charge for this type of service are tremendously reduced.

Because of the rapid development of fintech and its extension into previously untapped markets, people can now obtain financial services more easily (Popkin, 2019). As a global network, the Internet connects intelligent machines, software applications, and

people. Five billion people utilize the internet today, which represents 63 percent of the world's population (Statista, 2022). Trends indicate that roughly 196 million new people access the internet each year or the number of internet users grows approximately at an annual rate of 4%. 4.6 billion people, or 92.1% of all internet users worldwide, use a mobile phone to access the internet occasionally. Today, mobile phones account for more than 55 percent of the online time, as well as close to 60 percent of the world's web traffic (DataReportal, 2022). By overlooking the worldwide internet use by the countries, it can be noted that the largest share of internet use has the US (internet penetration rates maintain over 90%) and China (World Population Review, 2022). China is the front-runner in terms of fintech adoption, with 92% of Chinese using fintech banking and payment and 91% of financial management solutions in 2019. The USA is in second place in terms of fintech banking and payment adoption with 52% and with 49% in financial management solutions in 2019. Compared to 2018, the number of Americans that use digital banking increased by only 4% (in 2022 end up with 65.3% of the US population), whereas huge growth from 5% to 38% was registered, especially between 2013 and 2018 (Howarth, 2022).

The penetration of the Internet for e-banking is gaining momentum in EU countries as well as in the Republic of North Macedonia. According to the EU agenda, EUR 9.2 billion is expected to be invested in key digital technologies between 2021 - 2027. The aim of the new Digital Europe investment program is to ensure that all Europeans have the skills and infrastructure needed to meet a range of digital challenges (European Commission, 2020). While 61% of Europeans use the Internet for e-banking, North Macedonia, together with the neighboring countries, is at the bottom of the table (see Figure 3).

Figure no. 3 Individuals using the Internet for e-banking



Source: Eurostat (2022)

Looking at the upward trend of digitalization and how fast the fintech industry is growing, it is clear that it will soon become an integral part of the future of finance and

should be closely monitored by the Macedonian banking sector. According to the research done by Danevska et al (2022), 67% of Macedonian banks claimed that they were close to greater digitalization, and 33% plan to realize it as a long-term commitment. The fact that Macedonian consumers (88% of respondents) express their willingness to use digital products and services is encouraging. They expect more diversified and wider financial offers in the future.

In what follows, the focus will be to analyze the level of development of fintech solutions in the Macedonian banking sector. Special emphasis is placed on factors that motivate/demotivate banks to digitalize their processes by themselves or to use services from outsiders (outsourcing of the bank activities). The analysis will show the level of digitization of the domestic banks, the application of the appropriate regulation for the further development of fintech solutions and banks' perspectives in the information age.

2. Literature review

Due to the multidisciplinary nature of fintech (finance and technology together), so far have been no differentiated clear definitions for it. Different authors, experts and theorists define fintech in different ways, depending on their research goals. Perhaps the most comprehensive is the following definition of fintech, namely, a cross-disciplinary subject that includes innovation, technology, management, and finance. It encompasses all creative ideas that improve financial service operations by suggesting technological solutions in line with different business situations. The ideas may also lead to new business models or even new businesses. This definition emphasizes the multidisciplinary character of the fintech industry and points to its dependence on modern technology.

Table no. 1 - Existing fintech definitions

Author(s)	Definition	Key hallmarks
Bettinger (1972)	The term "fintech" stands for financial technology, which combines information computer technology, modern management science methods, and bank expertise.	Focus on incumbent, sustaining innovation
Arner et.al (2015)	Financial solutions facilitated by technology are referred to as "financial technology" or "FinTech." Peer-to-peer (P2P) lending is one example of a Fintech business model. The term Fintech refers to the complete range of services and goods that have historically been offered only by the financial services sector.	Focus on modern technology
McAuley (2015)	Fintech is an economic industry composed of companies that employ technology to make financial systems more efficient.	Focus on companies

D. Huang (2015)	Fintech is a company that uses technology in the areas of banking services, payments, data analysis, capital markets and financial management.	Focus on companies
Maier (2016)	By employing technology to provide value to customers in a different way, new fintech companies are attempting to compete with established financial institutions.	Focus on new market entrant, disruptive innovation
Jun and Yeo (2016)	Recent developments in information and communications technology (ICT) have led to the rapid emergence and expansion of new and innovative financial services, often termed as Fintech.	Focus on new market entrant, disruptive innovation
Kim, Y et al (2016)	Fintech is a service industry that employ mobile-centered IT technology for the purpose of improving the effectiveness of the financial system.	Focus on financial service
Investopedia (2016)	Fintech is a portmanteau of financial technology that describes an emerging financial services sector in the 21st century.	Focus on modern technology
Ernst&Young (2016)	Fintech refers to organizations that combine innovative business models and technology in order to enable, improve and disrupt financial services.	Focus on companies
Schueffel (2016)	Fintech is a new financial industry that uses technology to advancefinancial activities.	Focus on new market entrant, disruptive innovation
D. Varga (2017)	Fintech is a company that is totally unregulated in the legal system or is only partially regulated. The task of FinTech businesses is to provide innovative financial services through new technology. Fintech companies were established to provide advanced financial services that go beyond the traditional scope.	Focus on companies
Gimpel et al. (2018)	Fintech characterizes the usage of digital technologies such as the internet, mobile computing, and data analytics to facilitate, develop, or disrupt financial services.	Focus on new market entrant and industry incumbent

Source: Our own research

Both financial and non-financial institutions and businesses can enter this industry if they offer modern digital financial services. An overview of the most popular fintech definitions is presented in Table 1. The table shows the inconsistency in defining fintech among different authors. Some authors define fintech as a technology and innovation, others associate it with financial service and third describe it as a company. Taking into account the various theoretical points of view and definitions of fintech, it can be concluded that the most important elements are: 1) fintech is a company that provides financial services on its own behalf or it provides financial services to other entities; 2) it has

innovative, modern and original character meaning that fintech uses the most modern technology in the provision of financial services, and 3) the scope of activity can be global (using large technology platforms), international (well-established financial and non-financial institutions) or local (small companies just starting their operations). At this point, the term "fintech" is ambiguous and leaves space for further discussion.

Evans and Browning (2021) indicated that financial services that went through the biggest changes because of the fintech are: payment services (cashless, mobile payments, cryptocurrencies, digital wallets), retail banking, financial advice (data analytics, AI, robo-advice, automated trading of investments), insurance (Insurtech), alternative finance (crowdfunding, peer-to-peer lending) and regulatory technology (regtech). However, the evolution of fintech and its technologies is presented in the following table:

Table no. 2 - The development of fintech and new technologies in each stage

Fintech 1.0 (1866-1967)	
Development	**Key technologies**
Era of key enabling technologies Finance and technology combined to produce the first period of financial globalization	1866 - First transatlantic transmission cable 1918 - Fedwire (electronic fund transfer) 1950 - Credit cards (Diner's club) 1966 - Telex
Fintech 2.0 (1967-2008)	
Era of Internet technologies Analogue to digital transfer, led by traditional financial institutions	1967 - ATM 1971 - NASDAQ and electronic trading 1973 - SWIFT 1983 - Mobile phones 1983/1985 - Online banking 1999 - Internet
Fintech 3.0 (2008-)	
Era of data technologies Emergence of new players (start-ups)	2007-iPhone 2009- Bitcoin 2009- Reward-based crowdfunding 2011 - P2P money transfer service 2011 - Google wallet 2014 - Apple Pay

Source: Our own research

With progression in technology, fintech will continue to drive disruptive business models in financial services.

3. Research methodology and data collection process

To answer the research questions, two sources of data were used:

A) Primary data: During the research in the field, the survey method and the method of direct interviews were used. A survey with banks is conducted, by using two extensive questionnaires. One regarding the E-banking implementation and development in the Macedonian banks until 2014 and the other extended for the challenges and perspective of e-banking management (analyzes of PC/Internet banking and mobile banking) and other fintech products and services in the Macedonian banking sector in 2022. The research instruments contained open and closed questions (Likert scale, semantic differential, multiple choice questions). The period of the research of the first questionnaire was November 4 to November 21, 2013. At that time there was a total of 15 private commercial Macedonian banks and the response rate of the questionnaire was 86.7%. The second questionnaire was performed between February 15th and April 1st, 2022. Replies were collected mainly by e-mail, the social networks, as well as by personal contacts. The rate of response was 66.7%, i.e out of total 12 private commercial banks, 8 answered the questions. For the processing of the data, comparative analysis of the current level of digitalization of the Macedonian banking sector with the situation until 2014 was made by using mainly primary data sources.

B) Secondary data: information and data from fintech-related publications, such as academic journals, statistical data, reviews, e-books, published presentations, blogs, and published expert opinions. Online resources predominated. The Internet is flooded with numerous articles, evaluations, and discussions concerning the usage, benefits, and drawbacks of the banking sector's digitalization and relationship with fintech companies. The study draws on both domestic and international writers' published works and publications on fintech applications for the banking industry.

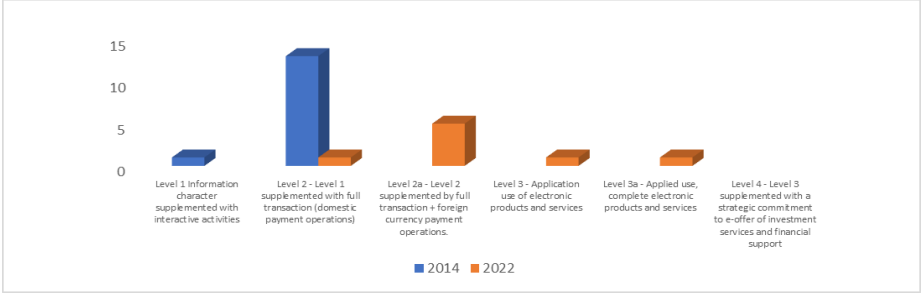
4. Analyzes and discussions

The beginnings of e-banking, as one of the first appearing fintech (at the beginning PC and later as mobile banking) date back to the early 1970s. The internet allowed banks to offer many new financial services and products: such as e-payments, m-payments, online loans, online brokerage, mutual funds, etc. The fast pace of life, the client's easy access to the Internet, the possibility to make a million dollar transaction with just one click, the Covid-19 pandemic, made e-banking develop rapidly, both in the world and in our country. In January 2012, only 63 million Americans were recorded as users of e-banking. Ten years later, 217 million Americans or 65.3 percent share of the US population are using digital banking. Furthermore, 38% of US personal loans are granted by fintech's. (Statista, 2022)

The analyzis of the application of fintech solutions in banking operations by Macedonian banks, showed that all 100% of the respondents had their own ATM systems and issue payment cards since 2014. The first e-banking transaction carried out over the computer was performed by Eurostandard Bank AD Skopje in December 2003. Pioneers in introducing m-banking were two banks from the group of large banks (Stopanska Banka AD Skopje and NLB Tutunska Banka AD Skopje). In 2014, m-banking was in its infancy and to the greatest extent covered only payments in domestic payment transactions for retail. Hence, in the beginning, most of the activities offered by Macedonian banks through smart mobile phones referred to overview and status of accounts, cards, deposits, and print statements; internal transfer of money, payment to third parties in mainly domestic payment transactions and custom templates for periodic payments (e.g., monthly overheads). Almost twenty years later, all twelve Macedonian private commercial banks are offering e-banking. Fostering the process of digitalization imposed by Covid-19, there is an upward shift in the use of the internet for e-banking by 12 percentage points compared to 2019 (before the Covid-19 pandemic). Hence, 18 percentage points increase is marked from the field research compared to 2014. Along with other European countries, North Macedonia exceeds the average of the Balkan countries but is still far from the European average of 61% in the application of e-banking (Statista, 2022).

To identify the level of digitalization according to the domestic banking activities, the authors analyzed four main stages of the development of e-banking services. The first phase of training and gaining experience, that is, a phase consisting of marketing and promotion (development of a marketing website); Second phase: Easy interactivity in domestic and foreign payment transaction; Third phase: Actual online banking by making a distinction between informative and applied use (full transactions and services); and Fourth stage: Strategic use i.e. strategic changes (Stoneburner, Goguen and Feringa, 2002).

Figure no. 4 Indication of the level of bank digitalization (by number of banks)

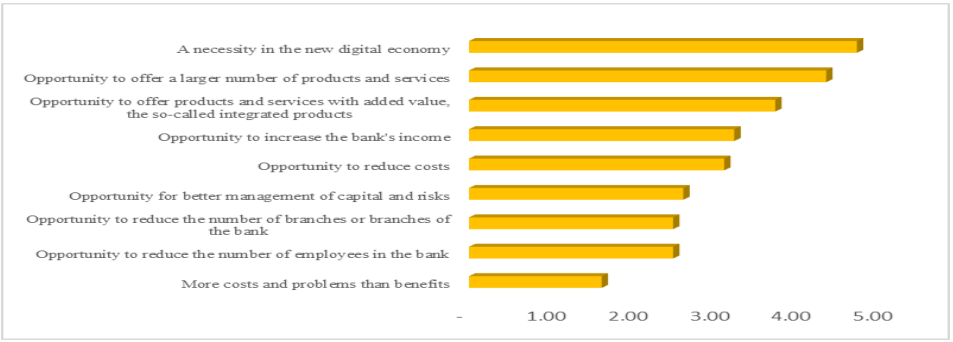


Source: Adjusted and enlarged from Danevska, B.A. et al (2022)

Results show that the banks in the Republic of North Macedonia follow the latest trends in digital banking at a lagging pace. Up to 2014, 87% of the banks had implemented e-banking but mainly used it for e-payment and monitoring of the balance and turnover of accounts, transactions made on domestic cards, and deposits on a very basic level 2. One bank from the respondents declared that the website is still used for informational purposes, supplemented with interactive activities, such as transaction account, debit or credit card application, calculator for various types of loans, etc.). Eight years later, 12.5% of the surveyed Macedonian banks are still at the same level 2 and only 25% of them (two banks) have moved further and declared that they are in the third stage of the development of e-banking. However, almost two thirds of the banks (62.5%) have an average level of their digitization at level 2a, i.e. performing e-payments and other transactions in domestic and foreign currency payment operations. Not a single bank responded that it offers corporate e-loans (CreditOnWeb), online investment banking services, such as trading and brokerage, or asset management, personal/corporate finance or investment robo-advisers and InsurTech services. The questionnaire just confirmed that banks in the Republic of North Macedonia dominate as traditional commercial banks and only slowly follow the new trends in digital banking. Embedded, ubiquitous banking which is the features of the global banking system since 2017, according to King (2018), is only emerging in the Macedonian market. It is clear that Macedonian banks will be challenged in near future with a rather difficult period of innovations in financial services with greater financial inclusion and redefinition of their banking business models.

Alongside the traditional way of banking operations that still dominates the banking system of the Republic of North Macedonia, positive views for e-banking use by Macedonian banks are increasingly perceived. According to survey data from 2014, 75% of Macedonian banks saw the adoption of e-banking as a chance to boost the bank's revenue and customer base and as an opportunity to offer a greater number of products and services, but only 25% of banks saw e-banking as an opportunity to improve risk and capital management processes and as an opportunity to reduce the number of employees and branch offices or branches of the bank. Hence, the application of e-banking was seen mainly as an opportunity to simplify basic banking operations (payments from and to the bank) and facilitate customer access to their accounts. To assess their today’s views, banks were asked the same question by assigning a level of intensity on a scale from 1 to 5 (see Figure 5).

Figure no. 5 Banks' view of the e-banking implementation



Source: Danevska, B.A. et al (2022)

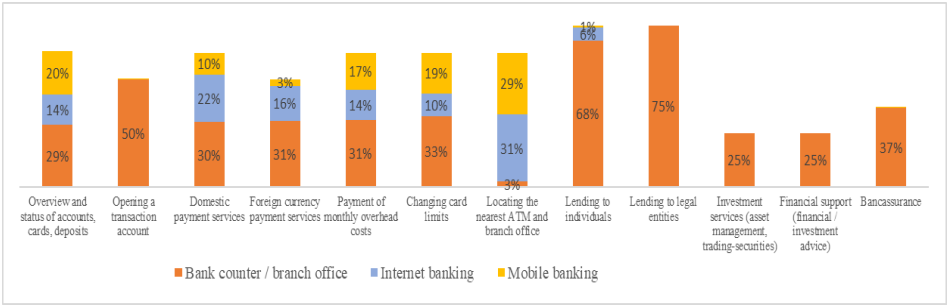
Likewise, to the comments made in 2014, banks today highly recognize e-banking as a necessary tool that should be implemented in the new digital economy, that offers an opportunity for a large number of products and services. Greater advantages that Macedonian banks also see in terms of e-banking are the possibility of higher revenues, lower transaction costs, and the possibility of increasing the number of customers.

However, contrary to the worldwide challenges of the e-banking implementation, Macedonian banks consider that the net effect of the introduction of e-banking is neutral or with a low level, in terms of opportunity for better management of risk and capital, decreasing the number of branches and reducing the number of the bank's employees. Further, a worrying issue is that the research showed that Macedonian banks estimated the impact and the direction of impact of the introduction of e-banking over the number of the bank's employees with low level. They neither recognize that e-banking will have influence over the change in the number of employees nor with the estimation of 2.88 see the need for retraining at this stage. However, direct interviews with bank representatives and field analyzes showed that they are aware that at the expense of increased risks (operational, above all from the aspect of the security of the information system, strategic and reputational risks) with the introduction of e-banking, it is expected to have a reduction in the risks related to the human factor that arose from the traditional manual, paperwork in the distribution network of the bank.

When banks were asked "…through which of the given channels do you think that the clients use your banking services more…." in 2014, 77% of banks responded that their customers use banking services more through bank counters and branches. Only three banks considered that their customers use bank counters and online banking equally. According to the current analysis of banks' data, which indicate customer preferences for using banking services, 62.5% of respondents said they preferred using bank branches

more, while 32.5% said they preferred using e-banking services. Unfortunately, even today no bank answered that customers use banking services more through internet banking. The Macedonian mentality, which hardly abandons the traditional way of working, is again reflected in the answers given to this question. Furthermore, to assess which of the channels clients use more for the banking services, based on banks' data and reports, the results (see Figure 6) show that clients chose to visit "brick and mortar" banks more often for practically every service offered.

Figure no. 6 Banks' data regarding the most used channels by the clients



Source: Our own research

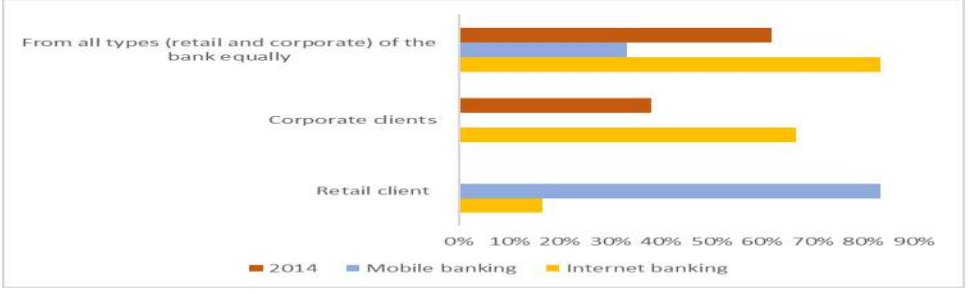
E-banking is leading mainly in locating nearest ATM and branch office, domestic payment services, overview and status of accounts, payment of monthly overhead costs and changing card limits. The traditional way of banking still dominates where clients still use more the banking services and products through bank counters and branches. These findings point out that Macedonian banks are at the beginning of the digitalization path. Field analyzes confirmed that the biggest challenge for the Macedonian e-banking is still the low level of digital skills among the domestic population. Greater resistance, and lack of interest, are especially spread among elderly people. (Parnardzieva Stanoevska Elena 2021). On the other hand, as will be elaborated below, Macedonian current legislation is not yet adapted and harmonized with the current world tendencies in creating digital banks, thus protecting, and fostering a traditional way of banking.

With the process of digitalization and fintech development, the need for counter operations and bank branches is significantly reduced. The introduction of fintech solutions in the banking sector presupposes greater financial inclusion and redefinition of banking business models. Reduced transaction costs lead to reduced visits to branches, reduced volume of high-frequency routine transactions, and leads to the need to redesign their role or eventually to their closure. This process practically leads to the creation of digital banks and digital banks do not have a brick-and-mortar branch network. Instead, they have one

registered head office. (Sucubaşı et al, 2022). In this regard, Macedonian commercial banks were asked whether they are planning to change the number of bank branches according to their strategic plans. Unlike the fintech trends, only 25% of the banks responded that they plan to decrease the number of bank branches, half of them responded that they are not planning any changes, whereas 25% even responded that they are planning to increase the number of bank branches.

From the perspective of the domain covered and the type of customers, in 2014 the largest number of Macedonian banks (62%) declared that e-banking is equally used by both corporate and retail, 38% replied that is more used by corporate sector and that they mainly offered e-banking service for domestic payments. Only one large bank answered that they offer e-banking for foreign payments and only one small bank replied that it does not offer internet banking at all. As can be seen from Figure 7, in the questionnaire in 2022, the largest number of Macedonian banks, i.e. 83% stated that Internet banking is equally used by both corporate and retail, but also 67% agreed that corporate dominate in its use whereas 83% responded that m-banking is mostly used by retail clients.

Figure no. 7 Bank customers, Internet and Mobile banking users



Source: Our own research

The same authors' earlier study came to the conclusion that Macedonian banks and customers are gravitating more and more toward e-banking, which is a striking truth that will grow in the next years. Thus, 88% of customers still anticipate that banks will become more digital in the future and will have a bigger variety of new technical products and services available to them (Dimitrieska et al, 2022).

From the research carried out (where 100% of the banks answered positively), it could be unequivocally concluded that since 2014 all Macedonian banks within their business operations have established special teams for introducing and monitoring e-banking. As a result of advances in technology and the rapid development of the Internet today, e-banking transactions can be created and tracked through standard online viewing

tools or through financial planning software packages. The application of fintech especially in the banking sector should contribute to the improvement of service and business processes of banks, simultaneously creating time added value for enterprises and society.

Regulatory framework for managing the fintech

Requesting for a new framework for doing business in the banking sector, e-services are increasingly influencing the fundamentals of economic theory and business practice and thus increasing the need to redefine government and central bank policies concerning the e-service sector. In today's modern and imaginative methods of financial services, we are faced with a mix of banks, capital markets and insurance management products in accordance with the needs of corporate clients and the population. Namely, the absence of borders between these three sectors also means that the need will emerge for a much higher level of cooperation in order to manage the various risks, such as maintaining the business presence of newcomers, conglomerates, and competitive products developed within each of the above sectors or as a result of their interactions. This can lead to a change in the role of different traditional financial instruments, to new challenges for regulators from each sector respectively, and to the need for comprehensiveness in the processes for effective implementation of fintech solutions. The challenge that every country has to face, including ours, is the need to introduce and implement an efficient regulatory framework for managing the fintech, with the aim of maximum protection of customers from domestic or foreign fake/fraudulent online operators. Hence, under the influence of new technology, more and more attention will have to be paid to security challenges, as the biggest potential risks when performing e-financial operations. In that context, part of the questions in the questionnaire aimed to examine whether in the country there is an appropriate regulation set by the National Bank of the Republic of North Macedonia (NBRNM) for regulating fintech market.

Field results show that actual legal regulations that regulate e-banking in the Republic of North Macedonia consist of:

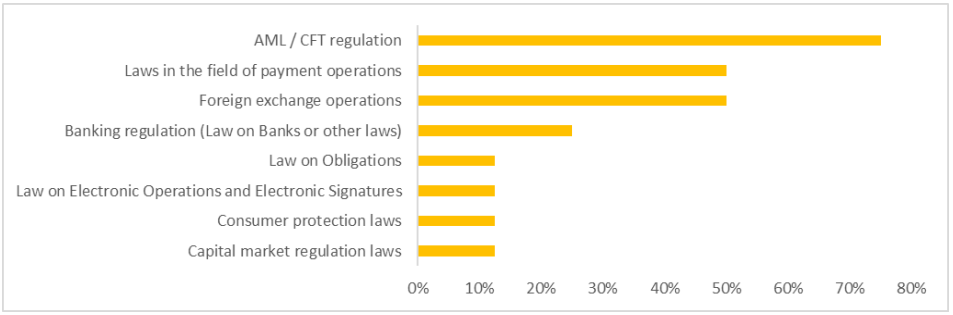
- Law for e-documents, e-identification, and confidential services enacted in 2019;
- Decision on the Methodology for the security of the bank's information system, revised and fully harmonized with the Basel principles in 2018.

The NBRNM strives to regularly monitor and implement main activities at the international level, aimed at creating preconditions and instruments that enable the strengthening of regulation in the Macedonian banking system. Regulators acknowledged that the existing regulation in North Macedonia does not accommodate fintech business models (NBRNM, 2020). From the same research conducted by NBRNM, it also can be

concluded that in the North Macedonia, although there is an infrastructure that supports technological innovation (regulators and the institutions) there is still a need for additional strengthening of the existing regulation as well as for enacting particular fintech legislation.

By interviewing the banks of their regulatory opinion, half of them confirmed that there are significant legal and other regulatory barriers for the successful operation and spread of e-banking on the Macedonian financial market. Hence, 100% of the banks answered positively that there is room for improvement in the existing regulation regarding e-banking. They all agree that the regulator should enable regulatory access to the new fintech players and should strengthen the legal regulation of non-banking financial institutions.

Figure no.8 Biggest regulatory barriers to working with e-banking



Source: Our own research

Hence, regtech framework has to be implemented in order to support fintech development in the Macedonian banking sector. From the existing legislation, banks have particularly identified the Anti-Money Laundering Law and The Law on Combating the Financing of Terrorism, the Laws on Payment Operations and restricted regulations in the foregn payments as the biggest regulatory barriers to working with e-banking (see Figure 8). The current limitation of these laws is that they require physical presence for identification, when conducting certain financial transactions. Hence, the Macedonian regulatory framework should consider changes and updates to those regulations in order to impose the creation of a new banking landscape.

The challenges of the information systems security and their regulation is still a top priority. Based on the results, in the framework of their business operations all Macedonian banks have established special practices (responsibilities, policies and controls) for operating with e-banking by the senior management bodies and for the management of e-banking with the use of external services (outsourcing) and dependence on third parties since 2014. Furthermore, 100% of the banks already have separate organization unit responsible for digital transformation. To ensure the continuous development and maintenance of operational and security infrastructure that will protect the data and e-

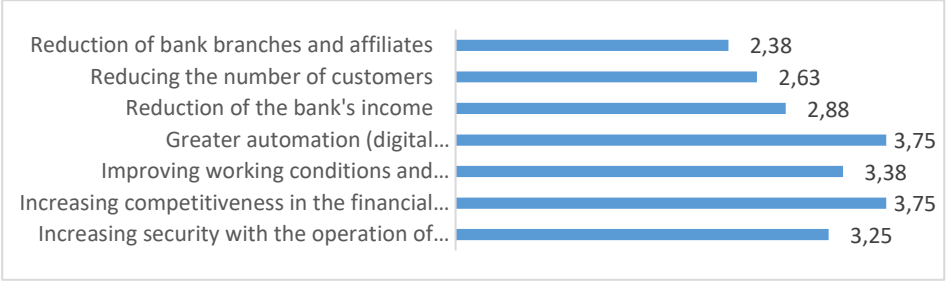
banking system from internal and external threats, half of the banks answered that at least twice a year (in 2014, over 70% of the banks answered that this is the case at least once a year) the highest management bodies review and evaluate the key processes of security controls for protection of the e-banking systems and data from internal and external threats. Compared to the past, it can be concluded that today the security of the bank's information system is strengthened and the evaluations regarding the key processes of security controls are intensified.

The results obtained from the survey conducted in 2022 only confirm that the regulation for risk management in terms of e-banking has been properly implemented by all Macedonian banks. Over 87% of Macedonian banks believe that the NBRNM provides clear guidelines for managing e-banking and that the current IIE regulation for e-banking management is sufficiently clear and understandable. Half of the banks believe that the NBRNM should issue a special decision or quid lines for managing e-banking and 63% think that the regulator should increase communication with the banks and provide training programs. All but one bank agree that e-banking management (especially in terms of operational security) should be raised to a higher level through the establishment of a group for e-banking at the level of the banking sector or by increasing the cooperation between banks.

A major challenge for Macedonian commercial banks in the coming period will be the new amendments to the Law on Payment Services and Payment Systems, the provisions of which will enter into force on January 1, 2023, which aims to contribute to a wider offer of cheaper payment services to citizens and companies. Through the application of the new elements of the law, Macedonian commercial banks will be faced with the setting of guidelines and limitations for fees for payment services, greater transparency, as well as greater competition (possibility of entry of new payment service providers). Therefore, during the research banks were also asked to estimate the degree to which the introduction of the new international regulatory framework in the field of payment operations will influence the daily operations of Macedonian commercial banks (on a Likert scale from 1- extremely low to 5 – extremely high). In total, the answers were neutral (see Figure 9). The highest value of impact 3.75 (neutral with intensity towards high impact) was assigned to:

- Greater automation (digital transformation) in the bank's operations, and
- Increasing competitiveness in the financial sector

Figure no.9 Impact of the new international regulatory framework in the field of payment operations



Source: Our own research

Furthermore, when asked about the intensity of impact that the introduction of fintech institutions would have over the Macedonian financial system, all banks replied that they mostly expect increased competitiveness in the financial sector and increased risk of cyber security. 75% expect changes in the current operational model, improved working conditions and new products development. Worldwide, one of the biggest obstacles to the spread and mass application of online banking is the security system, that is, the reliability of the banking payment system, as well as the psychological or perceived security fear of customers. In order to increase customer confidence that their transactions are secure, banks must educate their customer base about the type of security in place or provide customers with written assurances that their personal information will not be misused. Unfortunately, Macedonian banks do not consider that the new international regulatory framework will have impact over increased security with the operation of e-banking.

Use of services from external parties in terms of E-banking

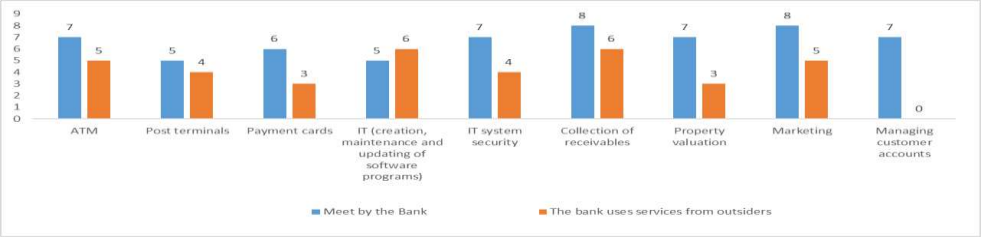
Given that the greatest impact of fintech is to lower the costs of mutual activities, many banks are forced to give up some of their corporate tasks in order to boost the efficiency of their operations. Banks must be consistent in ensuring the availability and timely delivery of financial products and services to their clients. They must have their own internal systems or applications for delivering e-banking products and services to end users or outsource the digitalized products and services, i.e. utilize services from external operators (applications, platforms from external third parties). Information technology progress inevitably leads to the separation of business processes.

From the obtained results carried out in the field, it appears that in 2014 the size of an average Macedonian bank was positively correlated to the process of separation of business activities in banks. In 2014, 64% of the banks replied in the questionnaire that

they take care of maintaining and updating the e-banking website themselves. Only 36% of the banks, primarily large and medium-sized banks, declared that they use services from outsiders for the same purpose. Unlike in 2022, most of the banks, i.e. 75% for internet banking and 100% for m-banking declared that they use services from outsiders for maintaining and updating the internet and m-banking, respectively. Hence, 2 banks responded that they maintain and update the internet banking by themselves, 2 banks responded that they maintain and update the internet banking inside the bank, however together with a third party and 4 banks use the services of outsiders. Regarding mobile banking, all banks responded that third party institutions are responsible for maintaining and updating mobile banking, while 2 banks responded that they additionally include third party. The empirical research confirmed that Macedonian banks are increasingly allocating a portion of their previously provided services to third parties, or purchasing those services from specialized suppliers, such as IT systems maintenance, collection of receivables, call center, marketing, etc. As a result, they recognize the most significant impact of e-banking, which is to reduce the costs of mutual activities in order to increase the efficiency of bank operations by forcing them to abandon some of their corporate functions.

Similar conclusions are reached if they are analyzed separately by types of business activities (see Figure 10 below). Unlike in the past, when the bigger the bank was, the more it tended to spin off its business activities. Today, by analyzing the types of business activities that are performed by the bank itself or by outsourcing, it could be noticed that large and medium sized banks are maintaining and performing much of the activities by themselves or together with a third party. Smaller banks tend more and more to spin off their business activities.

Figure no.10 Activities performed by the banks or outsourced (by number of banks)



Source: Our own research

Most of the business activities that Macedonian banks have declared that they perform independently are as follows: management of customer accounts, payment cards, collection of receivables, marketing activities, property valuation, managing ATM systems. Business activities for which Macedonian banks have declared that they use mostly as

services from outsiders are: information technology (creation, maintenance and updating of software programs) and using of post terminals.

Using external services from third parties brings about certain benefits, but on the other hand, it also causes corresponding risks. In practice, the amount of costs of certain (banking activities) services and the bank's profitability are positively related to the process of separation of business activities in banks. According to the results obtained from the questionnaire (see Figure 11), the majority of Macedonian banks, agreed that the use of external services from third parties leads to the following benefits:

- the possibility of greater flexibility,
- an opportunity to focus on essential things and provide better services;
- release of resources, cost reduction, and access to specialized vendors (external parties).

Figure no.11 The degree of agreement (on a scale of 1 to 5) as to whether the use of external third party services brings benefits in the banking

Source: Our own research

The research confirms that the processes of separation of the business activities, as a result of the application of advanced new technology, bring about numerous benefits, but also create serious challenges and risks for the banks. The risks of outsourcing can be manifested in loss of control of the banks for certain key functions, and the possibility of opportunistic expropriation of functions by individuals who offer external services. As long as the perceived benefits of using external services from third parties do not exceed the expected risks, Macedonian banks will tend to independently perform business activities.

Trends and perspectives for developing fintech solutions in the Macedonian banking sector

Financial institutions, particularly banks, are constantly changing and digitizing the processes that customers use to access their bank accounts, pay for goods, and obtain loans.

Embedded finance, defined as the integration of financial services into non-financial websites and apps, is growing in popularity as consumers and investors become more interested, particularly following Covid-19. The massive growth in the embedded finance market, which is currently worth $54.3 billion and is expected to reach more than $248 billion by 2032, is primarily driven by consumer needs and a desire for convenience (Howarth, 2022). In 2021 one Macedonian Bank (Silk Road Bank AD Skopje) was officially announced as the pioneer bank with the first issued pre-paid Visa cobranded card with fintech, in Southeast Europe. Fintech firms (particularly fintech startups) are currently fragmenting and unbundling the financial value chain by specializing in specific financial products and services. They disrupt incumbents in the finance industry by entering financial markets and using technology to reduce transaction costs and reach previously underserved markets (EBRD, 2021). According to several studies, the worldwide fintech market will be challenged in the near future as interest and investment in fintech grew significantly, along with the growing maturity of several fintech subsectors, increased investment in less mature jurisdictions, and surging corporate interest. The trends of the future challenges would be the following:

• Increased M&A activity as corporations and fintechs seek to gain scale in new markets and acquire complementary offerings to their existing business models. As more banks embrace the model and become service providers to non-bank and non-financial institutions, embedded finance will expand even further (KPMG, 2022).

• Increase of the neo-banks as they especially attract young consumers. Prediction is that 20% of the US population will have an account at a neo-bank by 2025 (Howarth, 2022).

• Increasing regulatory scrutiny on embedded finance offerings and putting in place regulations for high-volume banking cybersecurity. Regtech solutions must therefore provide safety, accuracy, and efficiency. Increased financial products or services embedded within and delivered by non-regulated entities is expected to increase regulatory awareness and intervention. As a result, an efficient regulatory framework for managing the financial, i.e. banking sector, will be required in order to protect customers from domestic or foreign fake/fraudulent online operators. The number of cyberattacks is estimated as the number of risks to the global financial system.

• Robotic process automation will take over mundane tasks. Additionally, the market of Al will increase in the banking industry as banks are becoming more aware of Al driven cost savings.

• Fintech firms will provide finance solutions as well as green initiatives. It will also concentrate on identifying itself as a data organization. As anticipated by KPMG, many fintech will likely rebrand themselves as data organizations and data providers that also

provide payments and other financial services in order to differentiate themselves in the eyes of investors and the market (KPMG, 2022).

• Low levels of financial literacy, weak technology ecosystems, and poor digital infrastructure especially challenge less developed countries (EBRD, 2021).

Investors, financial institutions, as well as Macedonian banks should particularly take notice of these global trends in their future scenarios for the development of fintech solutions. Thus, questions were asked to perceive the future perspectives of the Macedonian commercial banks in introducing new fintech solutions, as well as identifying the problems for greater application of more modern information technology.

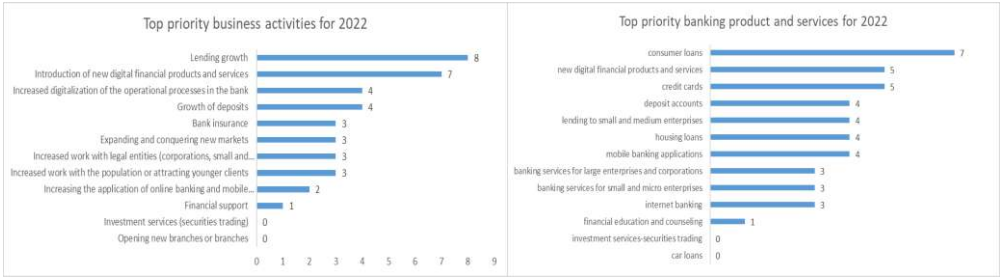
From the obtained results of the research, it can be concluded that the Macedonian banks still have difficulties ensuring greater transparency, both in terms of their operations and future strategies. Besides that, it was especially emphasized that the questionnaire is general and in no way penetrates into the confidentiality of the banks, some of the surveyed banks did not want to participate and some left the questions unanswered with the explanation that they represent a business secret for the bank.

In general, the conducted research once again confirmed that alternative finance is still a fairly new concept in the Republic of North Macedonia. The Republic of North Macedonia is still in the early stages of developing embedded finance and the adoption of more complex fintech solutions. Only 13% of the Macedonian banks responded that they use fintech solutions when asked regarding their perspective of the level of digitalization, their current capacity, and their future engagement in fintech innovation. However, 75% of the banks in Macedonia stated that even in the absence of Covid-19, their strategies are geared toward greater operational digitalization. One bank chose not to reply to this inquiry. All but one bank has responded that plans are underway to introduce new IT systems and/or upgrade current ones. Banks in Macedonia are still not prepared to participate in fintech innovation. As a result, only 38% of respondents believe they can only commit long-term to fintech innovation (stated as strategic commitment in the next 3-5 years). The results make it clear that Macedonian clients should wait for a longer length of time—between three and five years—before utilizing more advanced fintech products and services, even though digital products and services are highly significant for the customers. The small undeveloped capital market, as well as the need for implementation of the new regTech only confirms that the conservative approach to banking operations by domestic banks will prevail in the short run.

When asked about the top of their priority business activities for 2022 (see Figure 12 below), the banks stated that lending growth is on the top of their priority list, just like in 2014. Hence, the increase in lending, and in the number of customers, as well as the building and strengthening of the bank's brand were major priority business activities for

75% of Macedonian commercial banks for 2014. Analyzed from the aspect of banking products and services, about 75% of banks declared that housing loans, lending to small and medium enterprises and credit cards were identified as a priority products and services to be offered in 2014. At that time, only four banks (31%), primarily from the group of large and medium-sized banks, have identified e-banking (online monitoring, payment, lending, etc.) as a priority for development. Today, eight years later almost all banks have listed lending growth and the introduction of new digital financial products and services as priority business activities for 2022. When asked about the priority banking products and services according to their strategic goals: 87.5% responded that their priority banking products and services are consumer loans, while 62.5% have given priority to credit cards and new digital financial products and services.

Figure no. 12 Top priority business activities and banking products & services for 2022



Source: Our own research

Presently, at this stage of development, there are no challenger banks, neo bank nor Insuretech solutions in the Macedonian financial market. It is still too early to even discuss about the network (electronic) bank branches or the mass transition of customers to full use of online electronic financial services. As the main reasons for the insufficient application of new information technology, the Macedonian banks identified mainly the regulatory restrictions, staff training cost, lack of staff as well as increased high costs, and the need for new capital requirements (Sucubaşı, B. et al, 2022). Likewise, when banks were asked to rate their level of agreement (on a Llkert Scale from 1 to 5) for the advantages that contemporary technology delivers, the following advantages received the highest level of agreement:

- Developing new banking products and services (4.88)
- Fast and effective client communication (4.88)
- Providing innovative and higher-quality services (4.75)
- Increased competition and information system security (4.26)

• Enhancing the risk management process through the development of new models and databases (4.13)

• Expanding market share and entering new markets (4.13)

Only with appropriate and timely application of the benefits of the introduction of modern information technology in banking operations, commercial banks in the Republic of North Macedonia will be able to achieve profitable growth and become unattainable by their competitors. With the advancement of the internet, banks are faced with the challenge of introducing their own electronic platforms or purchasing products online in cooperation with some of the leading technological institutions. Embedded finance is pushing the financial services industry to compete online for its corporate and retail clients, as well as to streamline and strengthen inter-banking or other intra-industry business links. Namely, with lower transaction costs and investment in more efficient ways of conducting business banking activities, Macedonian banks can much more easily withstand the pressure of modern banking operations.

Macedonian banks will be obliged to continuously adapt their business models as a result of the quick pace of digital transformation and severe competition from financial corporations and many fintech startups that will enter the banking sector. As a result, they will need to make efforts to innovate and launch new products and services with added value for the final customer by utilizing a new technology. Furthermore, due to the economy of scale and scope, strong collaboration with fintech companies will be required for Macedonian banks' long-term profitability and viability. Aiming to mobilize the capital depending on the banking strategies and the intentions of their shareholders, some banks will be able to either a) independently access the organic growth by investments in new technology and exploring the available cost-effective solutions; b) others are likely to decide to be merged with or taken over by other banks or c) some will transform by outsourcing their activities or start to closely cooperate with fintech firms. Before deciding on any of the alternatives, each bank should clearly define the business reason for providing fintech solutions. In which of the above business models a bank will operate depends on its background processing systems and the technological infrastructure at its disposal. Today, in the increasingly competitive market of financial services, the application of the efficient strategy of new fintech solutions, is increasingly inevitable for the success of any bank. If some banks are not ready to change their business strategies, implement reforms, channel their own sales, and externalize some of their banking activities in the new digitalized environment, others will. Due to this, banks that do not adopt the new technology quickly (due to high startup costs or other management or technical issues) face the danger of losing their clientele to competitors that join the market first.

5. Conclusion and Recommendations

Digitalization is the biggest challenge that the Macedonian banking system will face in the coming years. The need to comply with the new payment regulation and increase competition from new fintech providers will in particular put pressure on the Macedonian banks in introducing new information technology and taking additional risks in their operations. Adoption of financial technologies is not without risk to financial resilience, inclusion, consumer privacy and welfare. The consequences of the growth of capital requirements and the invested quality of the credit portfolios, Macedonian banks will most likely mitigate by strengthening the income from the core business (net interest income and above all net income from commissions) along with simultaneous slow growth of operating costs.

The research shows that, despite ever increasing access to the internet and the development of fintech, the number of transactions performed through e-banking is relatively small. Hence, most of the Macedonian customers use them for informative needs and a large part of transactions are still carried out in cash and through bank counters. One of the reasons for this situation is primarily the conservative behavior of customers and their habits of being tied to existing services. Customers do not know how or do not have enough confidence, security to complete the banking affairs electronically. On the other hand, banks are not sufficiently aware of and do not use the benefits of electronic operations. They see fintech more as an unnecessary additional cost, and not as a useful tool for the promotion and sale of their financial products and services, as well as for faster and easier communication with their clients. The absence of a clear regulation or its inconsistency with the international one is just another additional obstacle to the greater development of fintech in our country. To address consumer expectations and bring e-banking closer to them, Macedonian banks are steadily launching new services. The long-term strategy of the Macedonian banks includes new fintech products and services as well as potential cooperation with new fintech startups.

The following are the recommendations for Macedonian commercial banks that can be outlined from the findings:

• Incorporate increased digitization of their business operations into their short-term strategies, as well as a more varied and expansive offering of new fintech goods and services in line with the demands of their clients!

• The Macedonian financial industry will soon see changes to payment methods, raising competition from new fintech players.

• Apply new business plans and strategies towards more collaborative initiatives with fintech companies!

• Actively join together in groups, commissions (technological, for risks, etc.) at the level of the banking sector for further development and facilitation of the fintech adoption!

• Expand e-loans (especially to corporate), introduce more algorithmic credit scoring, online investment services, financial/investment robo-advisers and InsurTech services!

• Customers/employees should be given educational programs, tutorials, and training on digital banking!

• Boost investments in cyber security, hence increasing client confidence!

• Start gradually redesigning the role of the branches as financial and technical advisors or eventually consider their closure!

Today, in this new digital era, only banks ready to adopt new technology (to enhance efficiency), prevent security failures, and react to changing consumer sentiments will survive and flourish in the Macedonian financial market.

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