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Testing the impact of banking financial technology on risk management based on the dynamic panel data approach

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Abstract

This study presents a model for testing the effect of banking financial technology (fintech) within online and mobile transactions on risk management for the group of banks and financial institutions listed in the Tehran Stock Exchange. This is applied research in terms of objective and is a descriptive survey study in terms of method. Statistical Society comprises 30 firms associated with the groups and credit institutions listed on the Tehran Stock Exchange. According to the last report of the Central Bank of the Islamic Republic of Iran and systematic removal for 2019-2022, five banks are chosen as sample size. Data analysis was done through regression and Eviews 10. The results confirmed that no significant effect exists between the online and mobile transactions and the risk management index of banks listed on the stock exchange. Therefore, the first hypothesis is not accepted. Also, it was found that online admission tools have no significant effect on the risk management index of selected banks listed on the stock exchange. Thus, the second hypothesis is not accepted. Ultimately, other results showed that mobile admission tools do not have a significant effect on the risk management index of banks listed on the stock exchange. Hence, the third hypothesis is not confirmed.

Key words: Banking Fintech, Capital Adequacy Risk, Risk Management, Operating Incomes

Introduction

The Spread of science and knowledge and the presence of advanced technologies make organizations and financial industries equipped with technology. Regarding the importance of fiscal issues, the technology world must include the most state-of-the-art knowledge that results in fintech. Fintech paves the way for doing the most previous financial services more easily and inexpensively. The fintech world will experience many developments in the coming years due to fintech popularity among startups and the banking industry (Deng et al., 2021).

Influenced by various digital revolutions, the banking industry of the world is experiencing major evolutions throughout

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its history (Arner et al., 2021). The modern arena of this industry causes fundamental challenges for traditional business models and existing institutions (Arianmehr et al., 2013). On the one hand, the pressure of new technologies imposed from other business territories provides the field for new activities and potentials, such as online identity verification, crowdfunding, and blockchain services in the banking industry (Scott al., 2017). On the other hand, digital era evolutions, such as the use of POS devices and the desire to keep data private have changed the intellectual models and behavioral patterns of customers, increasing their demand for financial services (Li al., 2017). In addition to the technology pressure and demand elasticity, digital evolution affects the administration of information technology (IT) and IT strategy of banks, and changes the processes and even the business model of banks (Richard, 2017). Therefore, banks existing around the world have to respond to these evolutions and revise their offered value and customer interaction methods (Yuan al., 2023).

Meanwhile, financial technology startups called fintech companies tend to quickly respond to emerging needs of customers or even create new needs among customers. This term seems that fintech can perform more agile than traditional financial institutions in using opportunities and presenting innovative solutions and customer-oriented approaches (Arianmehr et al., 2013). Therefore, fintech is known as an innovation driver in the financial industry, and it is predicted to play a vital role in the future of this industry (Sheng, 2021).

Fintech accelerates financial mediation and makes many customers leave commercial banks and go to fintech firms. Big data development of fintech, cloud computation, and other technologies have weakened the credit performance of traditional banks, including third-party payment models. The easy and diverse trade of third-party payment bypasses banking operations and reduces the credit performance of commercial banks. Traditional commercial banks are influenced by their managerial culture and lack of experience and perform slowly in response to new cases such as financial technology. Development ideas have not changed because traditional commercial banks lack professional fintech talents and the development of fintech companies has allocated a share of the traditional banking market to themselves. The profit has decreased because of increased competition between commercial banks (Li et al., 2022).

Fintech has broken the time and place limitations, and enabled the commercial banks to have more customers in a larger area. Online services and smart robots brought by financial technology have been replaced with offline labor, which has led to lower expenses (Payande et al., 2021). Fintech can enhance the innovative awareness of commercial banks, consider novel talents, and constantly bring innovation for new products and services. Commercial banks actively cooperate with fintech firms that one can identify them through some technologies, such as big data customers, and improve risk pricing of commercial banks. Fintech causes some inevitable hazards in the process of creating

challenges or opportunities for traditional commercial banks, which has a negative effect on the reliable and sustainable development of commercial banks. Since fintech has not changed its financial intermediary performance and nature, it still has traditional financial risks and hides the traditional financial risks. Moreover, fintech hazards consist of moral hazards and online software and hardware-based technical risks. Academic studies in this field mainly focus on the performance of commercial banks and the operating efficiency of commercial banks, and most studies mostly analyze the financial activities done by fintech firms (Li et al., 2022).

Fintech is a term used to describe financial technology. Any kind of technology in financial services consists of a wide range from jobs to consumers. A company is indeed described as providing financial services through software or technology and covers a range from mobile payment applications to cryptocurrency. Also, many services can be received in this field, including account management, commercial stock, cost and bill payments, and insurance management. Fintech has changed consumers' access to their financial affairs, and these changes have been accelerated over the recent year despite the COVID-19 pandemic. Now, fintech companies directly compete with banks in most financial sectors to sell financial services and solutions to customers. Due to regulatory goals and internal structures of banks, they always try to compete with fintech startups in terms of innovation velocity. Fintech has understood that all types of financial services, including money transfer, lending, investment, and payment need to integrally remain in the life of complicated and technology-interested customers of today to survive in the world where business and private lives are dramatically becoming digital (Nasehi Far et al., 2021).

On the other hand, banks see fintech as their competitors who are catching their market share, but this is not true. Banks enjoy a great advantage, which is their users' information. They can create new and novel services by giving these data to fintech companies and cooperating with them, which would result in the growth of modern banking services and the development of the digital economy in the country. With emphasis on the point that fintech companies provide solutions for the banks, some experts suggest that traditional banking society's orientation towards the activity of emerging firms must be rapidly changed. This change requires revising the rules and defining new procedures and structures. Zarinpal, PhonePe, Digipay, Nobitex, Ghabzino, and Toman are among the most popular Iranian Fintechs. Fintechs can disturb the business models of their rivals by using their intrinsic agility and lightness compared to the banks. This important case results in negative impacts on economic growth, confusion, doubt, and price fluctuations in relevant markets. Regarding the investors' tendency for risk reduction and high uncertainty in the fintech-associated markets, investment attraction in this field faces numerous challenges. By providing many advantages for their customers, fintechs have attracted many customers in the banking industry, especially the young generation. On the contrary, there are still some customers

who are not willing to use emerging businesses and adopt them with doubt. There are some reasons for the non-use of fintech by users and banks: no knowledge about the presence of fintechs and no need for using them, security, different legal environment of countries, and problematic attraction of investors in the framework of law, lack of confidence and uncertainty in the market, money laundering and fraud, and money creation. There are, however, other reasons, such as lack of information about the performance and uncertainty about them introduced by customers as the reasons for their no interest in fintech (Wang et al., 2020).

There are different views in the available literature about the relationship between fintech and banks' risk. Some researchers argue that fintech has the potential to reduce the risk of commercial banks. For instance, suggest that e-banking, online banking, mobile banking, and other business models can enhance the data collection capabilities of commercial banks. If these models are integrated with data mining, cloud computations, and similar techniques, they can significantly reduce the risk management-related expenses of commercial banks (Mirzaei Far et al., 2020). Prawirasasra, believe that the integration of emerging technologies in the financial sector provides the field for the effective attraction of consumer characteristics and risk features, which subsequently decreases banks' information asymmetry (Prawirasasra, 2020). Therefore, bank's risk-taking becomes weaker in practice. However, other researchers think differently. The use of fintech applications includes processing a large amount of personal and organizational data that highlights privacy and security as crucial concerns. The potential for malicious hacking and data breaches is a threat to financial system stability, which leads to personal information theft and financial fraud (Murinde et al., 2022). Moreover, increased competition by fintech disruptors may eliminate the market share of traditional commercial banks and make them look for risky jobs and customer sectors with lower returns. This phenomenon, which is known as "bad money drives out good" has the potential to excessively intensify the banks' desire for risk-taking behavior and subsequently strengthen the systematic financial risks (Fuster et al., 2016). According to the mentioned points, the test of banking fintech effect considered in the frame of online and mobile transactions effect on the risk management for the group of banks and financial institutions as the main problem of research.

Fintech has broken the time and place limitations and enabled the commercial banks to have more customers in a larger area (Baghani, 2020). Online services and smart robots brought by financial technology have been replaced with offline labor, which has led to lower expenses. Fintech can enhance the innovative awareness of commercial banks, consider novel talents, and constantly bring innovation for new products and services. Commercial banks actively cooperate with fintech firms that one can identify them through some technologies, such as big data customers, and improve risk pricing of

commercial banks. Fintech causes some inevitable hazards in the process of creating challenges or opportunities for traditional commercial banks, which has a negative effect on the reliable and sustainable development of commercial banks. Since fintech has not changed its financial intermediary performance and nature, it still has traditional financial risks and hides the traditional financial risks. Moreover, fintech hazards consist of moral hazards and online software and hardware-based technical risks (Li et al., 2022). Academic studies in this field mainly focus on the performance of commercial banks and the operating efficiency of commercial banks, and most studies mostly analyze the financial activities done by fintech firms. Few studies have focused on the underlying risk of fintech in commercial banks. Therefore, this study concentrates on the effect of using banking fintech on the risk management of commercial banks to present some solutions for risk decline.

A review of available literature indicates that few studies have been done on this topic about the banking fintech, especially in Iran. The literature review indicates the existing theoretical gaps in this field. In other words, we face a lack of resources and information shortage that reveal the necessity for further studies in this field. Therefore, this study contributes to literature enrichment. The distinctive aspect of this study is the results obtained from laboratory and field assessments that can help stakeholders make optimum decisions.

The results of some similar studies are mentioned herein:

The purpose of the study conducted by Rezanejad Kokhdan et al., was to identify and analyze the strategic factors affecting the cooperation between banks and fintechs. These factors were screened through the Fuzzy Delphi technique. Ten internal and eight external factors obtained de-fuzzy values greater than 0.7 and were chosen for analysis through Fuzzy DEMATEL. According to the analysis of internal factors using Fuzzy DEMATEL, the factors including the nature of bank customers' needs, forward-thinking of bank top managers, risk-taking culture among top managers and experts, agility of the bank's structures and processes have the highest net effect and effectiveness. In terms of external factors, the following factors were the most effective in cooperation between banks and fintech: competition intensity between banks, fee system, regulator's performance in legislation, and security risks and considerations related to fintech (Rezanejad Kokhdan et al., 2023).

The study by Khazaei et al., presents a model for the admission of novel financial technologies. In the qualitative phase, theoretical and empirical experts were interviewed based on the content analysis that led to the extraction of 77 subcategories, 16 main categories, and 10 final documents. The results of Structural Equation Modeling (SEM) showed the negative effect of cost and the positive effect of independent variables of awareness, perceived security, efficiency, easiness, and relative advantage on the attitude toward fintech products and services. Age and experience have a positive moderating effect on the relationship between independent variables and fintech products and services, while experience moderato does not have any

positive effect on the relationship between attitude towards fintech products and services with acceptance of fintech products and services but age does not have negative moderating role in this relationship. Therefore, it can be stated that attitude has performed as a moderator in the relationship between independent and dependent variables (Khazaei et al., 2022).

Gholami et al., carried out a study to identify the components and provide a model to implement fintech in the banking industry of Iran. The results introduced the causal factors affecting the implementation of the policymaking model: legislation, legal infrastructures, governmental loans, statutory incentives, and reform of macroeconomic policies. Other effective factors in this field play an intervening role: technology infrastructures and the creation of communication channels, and some factors play an underlying role in this field: intention to use technology, participation culture, entrepreneurship culture, risk-taking, learning and training, and trust building (Gholami et al., 2022).

Asgarnejad Noori et al., conducted a study to examine the effect of risk management on the development process of new products in the banking industry. The results showed that risk management of all risk indicators, including technology, market, environmental, fiscal, and organizational sources, and commercialization have a positive and significant effect on the development of new products in the banking industry (Asgarnejad Noori et al., 2022).

Payande et al., conducted a study titled "Future scenario for Iranian banks in dealing with fintech" and identified two significant uncertainties of "development of various fintech types" and "integrated digital authentication." Therefore, four main scenarios were described for cooperation between banks and fintech identity, sinusoidal, bracket, and logarithmic. Finally, dedicated plugin service strategies and programming interfaces were introduced to banks as stable strategies for cooperation. The results confirm that banks must take some measures to adopt possible scenarios and implement stable strategies. The mentioned measures were classified in the frame of strategic themes within three axes national governance, cooperation network, and technology management. Ultimately, the obtained results were confirmed after interviews with experts (Payande et al., 2021).

Yuan al., carried out a study titled "Your next bank is not necessarily a bank," believing that this paper presents new evidence on the effect of fintech expansion on the closure of bank branches by exploiting the acceptable exogenous diversity in fintech expansion generated by the largest fintech giant in China. We found that fintech expansion leads to an increase in the number and share of branch closures. The branching effects are significant only for those groups of products overlapped between bank and fintech companies, meaning that presumably advantageous products can be indeed replaced by new rivals from fintech. Our findings open a window to understanding how the global debranching trend occurs (Yuan al., 2023).

Sajid et al., carried out a study to The Role of Fintech on Bank Risk-Taking: Mediating

Role of Bank's Operating Efficiency. This study used a quantitative approach with secondary data collection from annual reports of 50 commercial banks in emerging countries (China, India, Pakistan, and Bangladesh) from 2014 to 2021. The results indicated that Fintech products would decrease the bank's risk-taking behavior by increasing the operating efficiency of the bank. Also, the results of path analysis showed that operating efficiency mediates the relationship between fintech products and bank's risk-taking behavior in emerging countries (Sajid et al., 2023).

Li et al., empirically analyzed the effect of FinTech on bank risk-taking and intermediary effects of three channels operating efficiency, financial innovation, and risk management. According to data of 37 Chinese commercial banks from 2011 to 2020, the results indicated that fintech could effectively alleviate the risk of banks. The results of further analyses confirmed that fintech could significantly affect the risk-taking of governmental banks, but it was not effective for rural commercial banks. It was also found that financial efficiency, financial innovation, and risk management had an indirect effect on the banks' risk-taking behavior (Li et al., 2022).

Guo & Zhang, conducted a study under the title of "The impact of bank FinTech on liquidity creation: Evidence from China" This paper investigated whether and how bank fintech affects the liquidity creation. Using panel data of Chinese commercial banks for the 2008-2019 period and bank-level fintech indices constructed by textual analysis method, this study finds robust evidence that banks with greater fintech development create more liquidity for the public. This effect operates through deposit inflow, risk management, and cost-efficiency channels. Moreover, this study concluded that the positive impact of bank fintech on the liquidity creation is more pronounced for banks with non-state ownership (Guo & Zhang, 2023).

Sheng, carried out a study titled "The Effect of FinTech on Banks' Credit Provision to SMEs: Evidence from China" By analyzing the lending records of banks in Chinese provinces from 2011 to 2018, they indicated that fintech effectively facilitated the banking sector's credit supply to SMEs (Sheng, 2021).

Methodology

Hypotheses

A. The banking fintech variable of the share of each accepting bank from total transactions of each online acceptance tool has a significant impact on the risk management index of selected banks listed on the stock exchange.
B. The banking fintech variable of the share of each accepting bank from the total transactions of each mobile acceptance tool has a significant impact on the risk management index of selected banks listed on the stock exchange.

Statistical society and sample

The statistical society of study comprises 30 companies of banks and credit institutions listed in the Tehran Stock Exchange following the last report of the Central Bank of the Islamic Republic of Iran in April 2022. According to the systematic removal

for the period of 2019-2022, five banks were finally chosen as the sample size. A systematic sampling method (based on systematic removal) was used, and 30 banks and credit institutions were chosen as the final optimum sample size.

Total number of banks in the group of banks and credit institutions listed in the Stock Exchange until 12 May 2022 30
Total number of banks that were not active in the stock market within the time frame of 2019-2021 (8)
Number of banks listed on the stock exchange after 2019 (5)
Number of banks who's their banking fintech data of studied interval are not available (12)
Number of sample banks 5

Model and variables

The risk-taking level of commercial banks is affected by banking fintech, bank-level individual characteristics, and macroeconomic variables. Thus, the following balanced panel regression model is used in this study based on the data and variables mentioned above and by referring to (Guo & Zhang, 2023), (Li et al., 2022) and (Mashhadi et al., 2019).

$$RISK_{it} = \alpha_0 + \alpha_1 FTII_{it} + \beta_5 INC_{it} + \beta_6 CAR_{it} + \beta_7 S_{it} + \beta_8 MC_{it} + \beta_9 ROI_{it} + \beta_{10} INF_{it} + \beta_{11} GDP_{it} + U_{it}$$

Where risk of asset-to-capital measures the risk-taking level of commercial banks, and FTII is the main explanatory variable, which measures the fintech innovation index of commercial banks.

$$Z - Score_{it} = \alpha_i + \beta_2 \mathrm{TF} - \mathrm{FTII}_{it} + \beta_3 \mathrm{TA2} - \mathrm{FTII}_{it} + +\beta_4 \mathrm{TA1} - \mathrm{FTII}_{it} + \beta_5 INC_{it} + \beta_6 CAR_{it} + \beta_7 S_{it} + \beta_8 MC_{it} + \beta_9 ROI_{it} + \beta_{10} INF_{it} + \beta_{11} SGDP_{it} + U_{it}$$

(Table 1) reports the research variables.

Table 1. Research variables (type and its operational definition)

Name of variable/symbol in the model	Operational definition	Type of variable
Z-score	Z-score= ($\frac{net\ profit}{assets} + \frac{capital}{assets}$)/ SD ($\frac{net\ profit}{assets}$)	Independent variable
RISK	Asset-to-capital ratio	Dependent variable
Fintech Innovation Index (FTII)	Bank fintech: share of each accepting bank from transactions of shopping center POS tools + share of each accepting bank from the total transactions of online acceptance tools + share of	Independent variable (banking fintech)

	each accepting bank from transactions of each mobile acceptance tool Number of transactions throughout the Shaparak Payment Network	
Technology Cart Foundation Index of fintech Innovation (TF-FTII)	Share of each accepting bank from total transactions of each shopping center POS tool	Independent variable (banking fintech)
Technology ipg foundation index of fintech innovation (TA1-FTII)	Share of each accepting bank from total transactions of each online acceptance tool	Independent variable (banking fintech)
Technology mobile application index of fintech innovation (TA2-FTII)	Share of each accepting bank from the total transactions of each mobile acceptance tool	Independent variable (banking fintech)
Operating income (INC)	The sum of operating incomes	Intermediate variable
Capital Adequacy Ratio (CAR)	Capital Adequacy Ratio	Intermediate variable
Size (S)	ln (Total assets)	Control variable
Management capability (MC)	$\frac{administrative\ and\ public\ costs}{sum\ of\ operating\ incomes}$	Control variable
Profitability (ROA)	$(\frac{Net\ assets}{total\ assets})$ *100	Control variable
Inflation (INF)	Inflation rate	Control variable
SGDP	real GDP/total loans (granted loans and claims from non-governmental individuals + granted loans and claims from governmental individuals)	Control variable

Data analysis

Descriptive statistics

As can be seen, the mean value of the risk management variable of banks equals 58.65, indicating the average rate of risk management of sample banks; the mean values of the transaction of online acceptance tools (TA1) and mobile tools' transaction (TA2) equal 159.92 and 1997.3, respectively. Among research variables, operating incomes (INC) and rate of return on assets (ROA) have the highest and lowest dispersion rates, respectively. Statistical analysis can be similarly interpreted for other variables used in the research model in (Table 2).

Table 2. Results of descriptive statistics of the study

Row	Z	RISK	FTII	TF	TA1	TA2	INC	CAR	SIZE	MC	ROA	INF	SGDP
Mean	0.056	58.65	0.0731	62.73	159.92	1997.3	18.40	2.844	21.67	-3938881.	1.355	45.25	39.240
Med	0.0570	30.330	0.0417	9.559	66.407	1324.6	18.33	3.090	21.72	-2322072.	0.918	46.350	34.99
Max	0.1470	708.48	0.4860	562.82	1089.42	13417.6	23.37	10.45	23.35	-494432.3	4.256	47.10	131.80
Min	0.0070	10.41	0.0034	0.00	0.000	0.000	14.99	-9.620	19.68	-13804814	-0.828	41.20	4.839
SD	0.0306	122.65	0.0925	127.3	246.86	2885.9	1.821	5.46	0.92	3771337.	1.411	2.39	32.53
Skewness	0.714	4.889	3.0893	2.582	2.410	2.469	0.667	-0.477	-0.445	-1.169932	0.707	-1.088	1.35
Kurtosis	3.88	26.27	13.63	9.256	8.467	9.235	4.322	2.380	2.64	3.340994	2.48	2.286	4.250

Assessment of variance of residues or errors

Breusch–Pagan test is used in this research to examine and test the variance of residues or errors, and results are reported in (Table 3).

Table 3. Results of variance homogeneity test on regression model's residues

Model	Statistic	Breusch–Pagan test
1	F-value	1.1749
-	Error level	0.3246

As seen in (Table 3), the error level of the Breusch–Pagan test in the research model is greater than 0.05 (5%), which indicates a lack of heteroscedasticity in the error or residues of the linear regression model.

Assessment of independence between residues or errors

The term "Serial Correlation" or "Autocorrelation" is used when values of a variable are correlated to each other. Thus, the Durbin-Watson (D-W) test is used in the linear regression models to analyze the independence between residues of the research model.

Table 4. Results of D-W test

Model	D-W statistic
1	1.793273

When the D-W statistic varies between 1.5 and 2.5, it indicates a lack of serial correlation or autocorrelation between residues. As seen in (Table 4), the D-W statistic equals 1.7932 for the regression model of the study, which is within the 1.5-2.5 interval. Therefore, the presumption of autocorrelation or serial correlation between residues of the model is rejected, so residues of the regression model are independent, and the model can be used to test research hypotheses.

Regression test

As seen, the R^2 value of the model equals 0.226889, which indicates around 23% of variations in the dependent variable (risk management) can be explained by variable and control variables. Also, the error level

of the F-value of the model equals 0.116379, which is greater than 5%; thus, it is confirmed that this research model does not provide high reliability in explaining relationships between research variables.

As seen in (Table 5), the t-value of the number of transactions throughout the Shaparak payment network equals -1.509716, its absolute value is greater than 1.96, and the error level also equals 0.1468 is greater than the error level of 5% (0.05); hence, the research hypothesis is not confirmed at the confidence level of 95%. Accordingly, it can be expressed that the number of transactions throughout the Shaparak payment network does not have a significant effect on the risk management index of selected banks listed in the stock exchange.

Table 5. Final model

Variable	Coefficients	Standard Error	t-value	Sig.
Transactions throughout the Shaparak Payment Network	-1308.398	866.6516	-1.509716	0.1468
POS acceptance tools	-0.338030	0.242418	-1.394406	0.1785
Online acceptance tools	0.017861	0.104988	0.170126	0.8666
Mobile acceptance tools	0.046497	0.031568	1.472891	0.1563
INC	-22.20543	38.86013	-0.571419	0.5741
CAR	-4.988325	5.821989	-0.856808	0.4017
Bank’s size	-193.0481	53.38419	-3.616204	0.0017
Public and administrative expenses	-2.89E-05	1.26E-05	-2.293124	0.0328
ROA	44.50370	28.06868	1.585529	0.1285
INF	-10.33561	10.20460	-1.012838	0.3232
GDP	2.069847	1.636537	1.264772	0.2205
Intercept	4899.694	1235.543	3.965620	0.0008
-	0.501219			
R2	0.226889			
F-value	1.827067	D-W statistic		1.704539
Sig.	0.116379			

Thus, the first hypothesis is not confirmed. In the case of acceptance tools for online transactions, the significance level of this test is greater than 5%. Hence, it is concluded that acceptance tools for online transactions do not have a significant effect on the risk management index of selected banks listed on the stock exchange. Thus, the second hypothesis is not confirmed. In the case of acceptance tools for mobile transactions, the significance level of this test is greater than 5%. Hence, it is concluded that acceptance tools for mobile transactions do not have a significant effect on the risk management index of selected banks listed on the stock exchange. Thus, the second hypothesis is not confirmed.

Discussion and Conclusion

Nowadays, banks have started competition beyond the financial service in dealing with increasing competition held by non-bank institutions. Therefore, traditional banks have lost some of their market shares. Fintech development has significantly affected the banks' activities, so many of banks' products are information-based. Therefore, this information can be purchased by other financial service providers. On the other hand, modern data analysis and IT have paved the way for the customization of financial services through digital techniques. New technologies have allowed to provision of financial services efficiently and effectively. These new methods have created challenges in the banking system of the past. Fintech is willingly or unwillingly the fact of the fourth industrial revolution. Thus, banks must start cooperating with fintech companies, especially in the field of businesses where fintech companies provide services complementing the bank services. The recent development makes banks enhance investment in fintech and revise the service-providing channels. They should increase standardization of more administrative and other tasks and services. Timely integration of fintech into business allows banks to achieve a relative advantage in the growing competition.

It is crucial to provide opportunities for activity and competitive and free entry of actors and modern viewpoints to the novel ICT fields. In this case, IT maturity, emerging business models, smart financial transactions, virtual banking, modern payment tools, and trust distribution are among the arenas through which monetary and banking evolutions are realized. However, modern banking, global trends, and innovative models must receive attention, which may be a threat to banks disturbing their positions if the mentioned topics are not considered and technical, legal, regulatory, and surveillance infrastructures are not strengthened.

Increased profitability of banks and enhanced income diversity would reduce risk-taking. Because banks can earn high returns through their present operating status, there is no need for adopting significant risks so their risk-taking motivation will be reduced. At the macro level, ultimately, the larger scale of the social financial provision indicates higher capital demand from the companies or individuals in the society, and banks most likely increase loans to meet the demand for social financial provision, which in turn leads to a corresponding increase in risk.

The following points are suggested regarding the obtained results:

1. It is recommended that all banks try to achieve digital banking; the significant point here is the integration of channels. Channel integration is required because ATM, POS, e-banking, mobile banking, etc. work separately at the moment, while digital banking provides the field for this case by integrating channels. Any change in any channel is applied to all of them. The main difference between digital banking and e-banking

is that banks provide their services to fintech companies.

2. It is suggested that banks use blockchain in some operations such as capital creation, providing capital for others, asset transfer, payments, and creation of new businesses to achieve banking novelty. The blockchain serves as a noncentralized database and protects the personal and financial data of customers by storing information about payments and profile details in several blockchain servers. This advantage facilitates some issues, such as fraud discovery and preventing cyberattacks. Also, blockchain eliminates the need for third parties in lending and credit systems, which facilitates the lending process and ensures interest rate reduction. Blockchain makes banking operations more inexpensive, faster, and safer.
3. It is recommended that banks use separate contracts; smart contracts are automatically used by computer protocols, which include a kind of agreement for operation or non-operation without any trust between parties. Smart contracts now can be realized based on the blockchain. Although this performance is limited due to a set of small instructions that is not complete Turing, bitcoin supports a small set of smart contracts. The next and most important open-text project is Ethereum, which tends to present a complete Turing programming language for supporting desirable code implementation within its blockchain, which in turn supports different types of smart contracts. Smart contracts create an agreement between two parties and execute that contract by a self-executing algorithm. The blocked money is released after the agreement terms are met. Smart contracts considerably decrease the role of the trust element. This feature minimizes the financial agreement risk and legal disagreements. These companies are developing some operating systems with blockchain potential for contract execution.
4. It is suggested that banks use blockchain technology for their customers' authentication process. Blockchain technology in the field of customer identity management can be highly effective in decreasing the costs of evaluation, registration, and updating identity data.
5. It is also recommended that banks use big data in some operations such as changing service levels, detection, and prevention of fraud, development of advanced and analysis-based reporting, customer segmentation, marketing, and customer relationship management, fights against money laundering, providing product customization for customers, risk management, inspection, and monitoring. Big data helps banks to use this information constantly to monitor transaction behaviors of the customers immediately after they occur. Big data allows banks to provide better services and resources. By using big data, banks can track unauthorized transactions and eliminate them, increasing security significantly. Big data makes it possible to control and track illegal transactions, fraud, and

such behaviors by analyzing and examining data at a large scale. In this kind of analysis, a part of the data may be ignored, missed, or reduced.

6. Consideration of the needs and demands of various ethnicities contributes to more influence of banks on these ethnicities. For this purpose, bank officials must consider some cases in their agendas: continuous social interactions such as meetings, formal and informal invitations to events and assemblies, accountability prizes, economic consultation, and bank service description. They also must describe the bank services easily and simply either via public media or through branches' staff from the first to end stages. They should not think that customer knows these affairs and services by default, so they should elaborate on all of them.
7. Any kind of negligence in behavioral and formal interaction with customers causes trouble and discomfort for the bank and customer; thus, accurate line staff training and transfer of required skills about how to treat customers are necessary. It seems that training typology courses for customer relationship management is an essential course for those organizations who have customs. If line staff attend training psychological and management typology workshops, they can know others and have more interaction and relationships with them, experience less conflict and tension in these relationships, and so the bank organization can achieve the most substantial goals of the marketing system.

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