IMPACTS OF FINANCE TECHNOLOGY APPLICATIONS ON COMMERCIAL BANK PERFORMANCE IN THAILAND

[1]DUSIT JAKSIL, [2]IRADA PORNCHAREON, [3]KRITAPA SAENCHAIYATHORN

[1]Ubon Ratchathani University, [2]Ubon Ratchathani Rajabhat University, [3]Khon Kaen University Thailand
E-mail: [1]dusitjaksil@gmail.com, [2]irada.sila@gmail.com, [3]krisae@kku.ac.th

Abstract- The purpose of this study was to investigate the impact of finance technology applications on commercial bank performance in Thailand. The samples of the study were 1,050 employees and administrators of commercial banks in Thailand. Questionnaires were used to collect the data. It was found that using finance technology in core business; namely, management account by bank, management account by customer, and deposit and withdrawal positively affected bank performance at a statistical significance level of 0.05. The financial technology usage in finance services; namely, payment service, investment service, and insurance service, positively affected bank performance at a statistical significance level of 0.01. The model was tested with Structural Equation Model (SEM) method and it was found that its χ^2 = 24.105,df = 20,χ^2/df = 1.205, p=.238, GFI = .995, RMSEA = .014, AGFI = .988, CFI = .999, TLI = .998, NFI = .995, RFI = .989, RMR = .021.

Index Terms- Financial technology, commercial bank in Thailand, performance

I. INTRODUCTION

The advancement of digital technology has greatly caused bank service changes due to the need of customers [1]. Presently, banks encounter competitors both from within the bank industry itself and from those non-bank entrepreneurs who have more technology expertise. Therefore, banks are trying to apply technology and innovations on their business operation for more efficiency and productivity so that they can serve customers faster and more accurately [2]. Baker [3] stated that the market selection processes that choose the winners and losers based on their relative efficiency, supposedly favor those who operate more efficient technologies. Firms operating less efficient technologies have lower profits and consequently, less money to fund their growth. As the industry evolves, the market shares of the inefficient firms converge to zero and they are driven out of the market.That is why banks with more efficient technology and financial innovations gain more market shares than those without. It is possible that traditional banks will face operation problems if they do not adjust themselves to meet the era of digitalization and technology revolution [4]. With respect to the number of bank branches in Thailand, it was found that there were 4,729 branches in 2006, and in 2015 it increased up to 7,061 averagely about 4.55% per year growth. However, after year 2016, bank branches were continuously closed. In March 2018, there were 6,740 branches left, averagely about 2.05% per year decrease. In spite of the decrease of bank branches, transaction via e-payments was contradictorily increases. In 2010, there were 1.1 billion transactions, and the number came up to 4.2 billion in 2017 with the average expansion of 24.3% per year [5]. This confirms that using technology is of much help to increase banks' service potential. The objective of this study was to investigate the impact of finance technology application on the commercial banks in Thailand.

II. LITERATURE REVIEW AND DEVELOPMENT OF HYPOTHESES

Financial Technology refers to new technology with potential to increase efficiency in providing banks' financial services. Financial technology growth originated from the unlimited advancement of computer that can analyze and process great amount of data, help to access goods and services in many channels, and provide many alternatives for customers to reduce their purchase cost [6]. Financial technology promotes innovations to serve customers more rapidly and conveniently. Transactions are more transparent and safer. In addition, it helps banks to be more international and can connect their data with external organizations resulting in wide expansion of their financial products and services [7]. According to Armer [8], financial technology development is of 3 eras; Fintechs 1.0, 2.0, and 3.0. Fintech 1.0 was from year 1866 to 1987 .

It was an era of financial free trade and it was at the first stage of transition from analog banking to digital one. Fintech 2.0 was from 1987 to 2008. This was a full entrance to digital era led by major finance institutions. Financial transactions were made via electronic system. The Internet was introduced in banking system. Fintech 3.0 started in 2009and continues up to present. There is a new group of financial servicers who are of non-bank. A large number of them enter the financial market. In the meantime, customers have different expectation on financial services, leading to a dramatic growth of Fintech. As for Santander [9], he divided Fintech into 2 periods; Fintech 1.0 and 2.0. Fintech 1.0 is now

capturing a growing market share but their overall effect on banking market has been minor. Fintech 2.0 is a collaboration between banks and innovative challengers and policy shifts towards open data and APIs, the emergence of enhanced technologies.
Fintech helps to manage cash via automatic teller machines in response to customers' need to use cash. However, due to the cashless policy and the non-bank entrepreneurs' less transaction fee as well as people's new life style of using smart phone to do financial transaction [10], the necessity to go to banks is lessened. Old customers are not interested in using bank services any longer Bank executives, therefore, need to find strategy to create bank values by using financial technology to promote the bank performance more effectively so as to satisfy customers [11].

Ways of financial technology development of banks in Thailand are of two folds [12];in-house development and cooperation with external organizations. In-house development can help to support digital banking, to improve internal processes, design new products and provide financial services on smart phone. Cooperation with external organizations can be undertaken in 3 ways:1) being partner with fintech entrepreneurs, 2) investing via venture capital, and3) supporting start-up community. Such cooperation is very helpful in boosting each party's strength. While banks have money, customers' database, network, and reliability, but need some time to change, Fintech entrepreneurs have financial innovations but lack capital and big database of customers [13]. Cooperation between them will, consequently, lead to more financial innovations that meet the need of customers in the digital era [14]. Beside this, fintech development including automatic system to check balance and payment, telephone banking, internet banking, and mobile phone banking, can assure customers of the efficiency and reliability of banks. It can help to improve employee's productivity, reduce customers' waiting time, increase service accuracy, and reduce risk of employee errors [15].

III. CONCEPTUAL FRAMEWORK OF THE RESEARCH

Achiraya R., Kagan A. & Lingam [16]'s two concepts of finance technology application were applied to:1) Financial technology related to core banking services which consist of management account by bank, management account by customer, and deposit and withdrawal; and 2)Financial technology related to financial services that include payment service, investment service and insurance service. As for the performance evaluation, the deposits, fees, investment, and insurance earned by each branch would be evaluated in comparison with the set target.

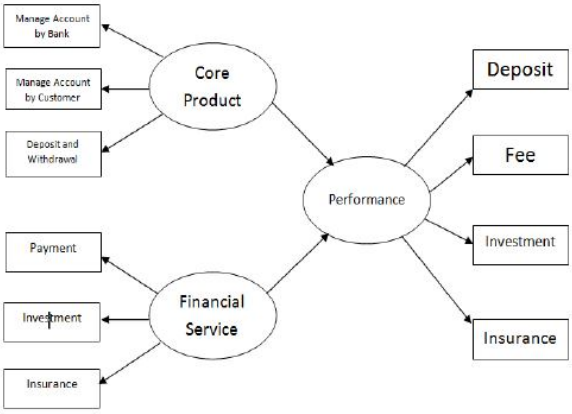


Figure 1 : Conceptual framework of the research

Research Hypotheses

H1: Using financial technology in core business positively affects bank performance.

H2: Using financial technology in financial services positively affects bank performance.

IV. RESEARCH METHODOLOGY

The samples of the study were 1,050 employees, and administrators of medium and large banks in Thailand .Systematic random sampling technique was employed to obtain the samples. Structured questionnaires were used to collect the data. The data were collected from January to March 2018. Validity of the questionnaire was calculated, using the data obtained from the experts. Index of item objective congruence (IOC)was calculated and the IOC value of every item was more than 0.6. Cronbach's Alpha coefficient method was used to calculate the questionnaire reliability. The reliability of the variables of using financial technology in core business, using financial technology in financial services, and the bank performance was0.91, 0.90, and 0.87 respectively. Descriptive and reference statistics were used to analyze the data. The hypotheses were tested with confirmatory factor analysis (CFA) to confirm the factor indicators of the observed variables in the measurement model of the factors related to using financial technology and performance. Structural equation modeling (SEM) was also used.

V. RESULTS AND DISCUSSION

It was found that the arithmetic mean of variables of using financial technology in core business, as a whole, was at a high level ($\overline{X}$ = 4.11, SD = .54) and, in detail, the means of management account by customers, deposit and withdrawal, and management account by banks were at a high level too($\overline{X}$ = 4.10, 4.04, and 4.0respectively). For the mean of the variables of using financial technology in financial services, the study showed that it was, as a whole, at a high level($\overline{X}$ = 3.90, SD = .55). The detail

consideration showed that the means of payment service, investment service, insurance service were 4.24, 3.93, and 3.31 respectively while the bank performance variable was at a high level ($\bar{X}$ = 3.57, SD = .81).

The meaning of the variables' abbreviations

COR = Core Business Technology
MAB = Management account by Bank
MAC = Management account by Customer
DEP = Deposit and Withdrawal
SER = Financial Service Technology
PAY = Payment Service
INV = Investment Service
INS = Insurance Service
PER= Bank Performance
PF1 = Performance of Deposit
PF2 = Performance of Fee
PF3 = Performance of Investment
PF4 = Performance of Insurance

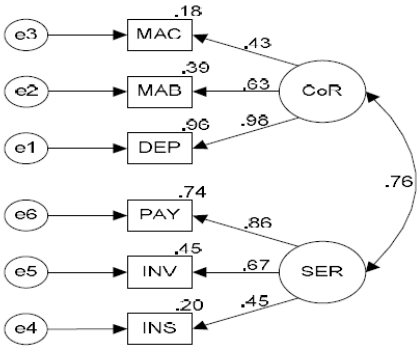


Figure 2: Core business technology and financial service technology variables

The confirmatory factor analysis of core business variables indicated that the factor loading values of the observed variables; namely, management account by bank, management account by customer, and deposit and withdrawal were .672, .427 and .981 respectively while those of the observed financial service variables; namely, payment service , investment service, and insurance service were *.863*, .672, and .451 respectively. Positive relationship was found in both variables of the measurement model (r = .761) as shown in Figure 2.

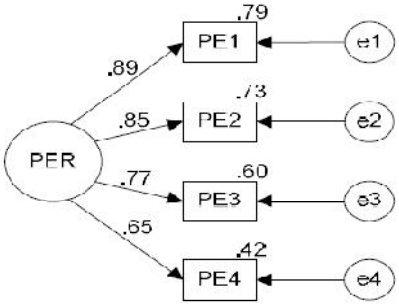


Figure 3: Bank performance variables

The confirmatory factor analysis of the latent variables of performance indicated that the factor loading values of the observed variables; namely, deposit, fee, investment, and insurance were *889.*, *773. ,853.*, and*649.* respectively as shown in figure 3 above.

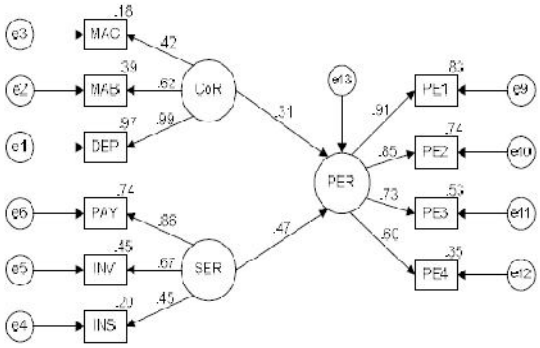


Figure 4: Final structural equation model of impacts of financial technology application on bank performance

Analysis of structure equation model

Table 1: Goodness-of-Fit indices for the developed model

Measures	Index	Fit Indices
Absolute Fit Level	RMSEA	.014
	GFI	.995
	P-value	.238
Incremental Fit Level	AGFI	.988
	CFI	.999
	TLI	.998
	NFI	.995
Parsimonious Fit Level	CMIN/df	1.205

According to the statistical analysis of the developed model, the factor loading values of latent variables of core business, specifically, management account by bank, management account by customer, and deposit and withdrawal were .624, .425, and .986 respectively, while those of financial services, specifically, payment service ,investment service, and insurance service were .861, .673 and .448 respectively, and those of performance; namely, deposit, fees, investment, and insurance were .914, .730, .847 and .605 respectively. The study also revealed that using finance technology in core business and in financial services positively affected the bank performance at a statistical significance level of .05 (p<.05) as shown in Table 2 below.

Table 2: Regression weights

Path coefficients for each pair of latent variables	S.E.	C.R.	P	Unstandardized Estimate	Standardized Estimate
SER → PAY	.172	11.261	***	1.937	.861
COR → PER	.043	2.066	.039	.389	.309
SER → PER	.101	3.029	***	.506	.469
COR → DEP				1.000	.986
COR → MAB	.036	17.672	***	.634	.624
COR → MAC	.033	12.861	***	.429	.425
SER → INS				1.000	.448
SER → INV	.132	11.461	***	1.513	.673
PER → PF1				1.000	.914
PER → PF2	.032	31.727	***	1.027	.847
PER → PF3	.032	27.216	***	.882	.730
PER → PF4	.036	20.371	***	.741	.605

Note. *** p<.001

CONCLUSION AND RECOMMENDATIONS

The purpose of this study was to investigate the impact of finance technology (Fintech) application on commercial bank performance in Thailand. The samples of the study were 1,050 employees and administrators of commercial banks in Thailand. Questionnaires were used to collect the data. SEM was employed to analyze the model. It was found and statistically confirmed that using finance technology in core business; namely, management account by bank, management account by customer, and deposit and withdrawal positively affected bank performance. Similarly, the financial technology usage in finance services; namely, payment service, investment service, and insurance service positively also affected bank performance. The study indicated that, according to the bank policy in Thailand, ways of financial technology development were of two folds. The first one was to do the in-house development. In doing so, research and development network was suggested to establish. Research on financial technology should be conducted so that they can be of help to improve bank performance. In addition, products and services should by designed to serve and satisfy customers. The second way was to cooperate with external partners. This could be done in three forms; being allied partner with financial technology entrepreneurs, investing via venture capital, and supporting start-up community to search for product innovation to serve and satisfy customers as a results banks could maintain their revenues and consistent performance continuously.

REFERENCES

[1] Zotti, A., &Dinardo, F. (2015). *The rise of alternative finance: How Fintech companies are revolutionizing the financial services and the traditional bank financing, University of DelgiStudi Di Padova*. Retrieved from http://tesi.cab.unipd.it/53120/1/Dinardo_Francesca.pdf

[2] Bronwyn, H. H., & Francis, K. (1998). *Effects of Technology and Innovation of Firm Performance, Employment and Wages*. Economics of Innovation and New Technology. Volume 6, pp. 3-17.

[3] Baker, P. F. (2004). *Are Inefficient Entrepreneurs Driven Out of the Market?* Journal of Economic Theory, Volume 4, pp. 329-344.

[4] Arnaboldi, F., &ossignoli B. (2010). *Financial Innovation in Banking*. Retrieved from https://convegni.unicatt.it/meetings_Arnaboldi_Rossignoli.pdf

[5] Bank of Thailand (2018). *Statistics of commercial banks.* Retrieved from https://www.bot.or.th/English/Statistics/FinancialInstitutions/CommercialBank/Pages/default.aspx

[6] International Organization of Securities Commissions (2017). *IOSCO Research Report on Financial Technology (Fintech)*. Retrieved from https://www.iosco.org/library/pubdocs/pdf/IOSCOPD554.pdf

[7] Salampasis, D., & Mention A. L. (2018). FinTech Harness Innovation for Financial Inclusion. *Handbook of Blockchain Digital Finance and Inclusion.*Volume *2*, pp. 451-461.

[8] Armer, D. W., Barberis, J.N., & Buckley, R. P. (2015). *The Evaluation of Fintech: A New Post-Crisis Paradigm?*. Retrieved from https://hub.hku.hk/bitstream/10722/221450/1/Content.pdf

[9] Santander, I. & Oliver W. (2015). *The Fintech 2.0 Paper : rebooting financial services.* Retrieved from http://santanderinnoventures.com/fintech2

[10] AL-Hawari, M., & Ward, T. (2006). The effect of automated service quality on Australian banks' financial performance and the mediating role of customer satisfaction. *Marketing Intelligence & Planning, Vol.24, no.2, pp. 127-147.*

[11] Pousttchi K., Moormann, J., &Felten, J. (2015). The impact of new media on bank processes: a Delphi study. *International Journal Electronic Business,* 12(1), pp. 1-45.

[12] Wachakorn, R. (2015). *Role of Fintech toward Finance Institute in era of Digital : Government Saving Bank*. Retrieved from https://www.gsb.or.th/getattachment//3IN_hotissue_fintech_detail.aspx

[13] Schweizer, A. (2016). *Integrating the Troublemakers: A Taxonomy for the cooperation between banks and fintechs : Research Center Finance and Information Management.* Retrieved from https://www.philadelphiafed.org/-/media/bank-resources/supervision-and-regulation/events/2017/fintech/resources/14_slides_schweizer.pdf?la=en

[14] Ghanty, J., & Gibson, L. (2016). *The Impact of FinTech on Financial Service Businesses. K&L Gates LLP.* Retrieved from http://m.klgates.com/files/Uploads/Documents/Session_VII_The_Impact_of_FinTech_on_Financial_Services_Businesses.pdf

[15] Dangolani, S. K. (2011). *The Impact of Information Technology in Banking System (A case study in bank Keshavarzi Iran)*. Procedia - Social and Behavioral Sciences 30 (2011) pp. 13 – 16.

[16] Achiraya, R., Kagan. A., & Lingam, S. (2008). Online Banking applications and community bank performance. The International Journal of Bank Marketing, Vol.26, no.6, pp. 418-439.

★★★