

Impact of Fintech Investment towards Banks' Performance in Malaysia, Indonesia and Thailand

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To Link this Article: <http://dx.doi.org/10.6007/IJARBSS/v14-i8/20424>

DOI:10.6007/IJARBSS/v14-i8/20424

Published Date: 02 August 2024

Abstract s

The rapid development of technology during the Fourth Industrial Revolution has spurred the growth of financial technology, bringing along an opportunity for innovation in the financial sector. Investment towards that sector draws the attention of banks worldwide under the promise of increased efficiency and therefore higher performance for their banks. The aim of this study is to examine the impact of financial technology investment on bank performance in Malaysia, Indonesia and Thailand. This study was conducted by analysing the data of 6 banks from these countries for a period of 10 years using multiple linear regression. Financial technology investment is measured using technology spending ratios as well as the intensity of research and development (R&D) of banks. Meanwhile, bank performance is measured by the profit margins of these banks. Analysis of the pooled sample found that financial technology investment significantly affects bank performance. The relationship between bank performance and R&D intensity for the pooled sample is significantly negative. However, the finding varies for each sample data according to each country. Therefore, banks looking to invest in financial technology should frame their investment plan by researching the opportunities and risks to their respective banks. They should also take into account the level of development of financial technology in the country and their long-term goals in investing in FinTech.

Keywords: Banks Performance, Financial Technology, Multiple Linear Regression, Fintech Investment, Malaysia

Introduction

The financial ability of a country and its' citizens are vital in spurring economic growth and thus enabling the overall development of a nation. One of the most important components in a nation's financial sector is the banking sector (Wu, Bai & Chen 2022). Due to the people's need for a banking system, the banking sector has been growing steadily and pushed to the forefront of the financial sector. Banks from all around the world play crucial roles to manage the people's financial assets and enable them to carry out financial transactions.

However the rapid development of technology in the Fourth Industrial Revolution pushes the traditional banks to innovate their operations and services in a bid to not fall behind. This need is further driven by the new norms of living post Covid-19 (IMF Annual Report 2020). When the pandemic first hits in 2020, drastic measures were taken to curb the spread of the virus such as imposing lockdown measures for citizens and countries' borders worldwide. This brought along the transition of lifestyle from face-to-face activities to online such as work from home, online distance learnings and other online economic activities. The increasing demand for technology following this transition had spurred many innovations in the technological field, which followed to post Covid-19 era. Now, the largely online new norm of living demands for faster, easier and more efficient services.

In the wake of such rapid technological advances, it is apparent that traditional banking systems has several weaknesses such as requiring the physical presence of customers at the banks, inaccessibility of the banking service for certain people Chen (2020), and obsolete technologies that challenges the integration of information (Diemers et al. 2015). These issues of rapid technological advancement Todorof (2018), the Covid-19 pandemic and the financial crisis of 2008 McKinsey (2022), had contributed to lower banks' performance. However, these factors also push banks into looking towards technologies that can be utilised to improve their efficiency and performance.

Financial technology, or fintech, is defined as technologically driven financial innovations that are able to generate business models, applications, processes and products, that brings about significant impact on financial markets, institutions or services (Financial Stability Board 2016). With the widespread usage of Internet in the early 21st century, efinance, which is defined as all types of financial services that are carried out electronically (Lee & Shin 2018), managed to break through global financial landscape. Fintech investment in the banking system has captured attention as one of the innovations that can be achieved by banks worldwide, with global fintech investment reaching \$210 billion in 2021 (KPMG 2022). Currently, more countries are reporting an increase in digitalisation rate of their financial services (Pahnenko et al. 2021), indicating the growing global interest in fintech.

Among the approaches used by banks worldwide is drafting a fintech development plan such as the People's Bank of China which has issued a Fintech Development Plan (2019-2021), establishing a subsidiary responsible for the bank's financial technology as well as collaborating with external financial technology firms (Lee & Shin 2018). More than 16 commercial banks have established financial technology subsidiaries in China by the end of 2021 (Wu, Bai & Chen 2022) while banks in the United States of America are focusing their spending on technology (Wall Street Journal 2016). The application of financial technology into the banking system can facilitate the operation of the banking system Knezevic (2018), and increase the inclusion of the service system to those who are previously excluded from banking services (Chen 2020).

Fintech startups are financial technology companies that provide services based on the personalization for each customer and providing data-based solutions. These companies are often times small but efficient organizations with an innovation-based culture (Lee & Shin 2018). The existence of such companies presents a threat to traditional banking institutions

(Diemers et al. 2015) by attracting the banks' customers with their technologically based services offered (Todorof 2018).

Therefore, traditional banks should collaborate with these companies to offer financial services based on digital technology and adding value for their customers. Such innovations in financial services by the banks could save time, costs and effort on part of their customers (Todorof 2018). This collaboration would also offer security to users by protecting them from the threat of cybercrimes as well as the disclosure of their personal information (Knezevic 2018). With these benefits presented, banks could draw more customers to their services and thus increase the performance.

Fintech investment and subsequent development has also been supported by the most governments worldwide, with government organizations formulating policies (Wu, Bai & Chen 2022) as well as implementing initiatives (Hasan, Hassan & Aliyu 2020) towards the application of financial technology in daily lives. This is in line with the findings of Diemers et al (2015) which classifies entrepreneurs, governments and financial institutions as participants in a financial technology ecosystem.

Therefore, fintech investment has become the main focus for banking institutions around the world (Wall Street Journal 2016). However, a question of whether fintech investment can improve the performance of the banks still stands. Previous studies have found that fintech investment has a positive impact on bank performance Wu, Bai & Chen (2022); Bakar & Nordin (2019); Feng & Wu (2018); Scott, Van Reenen & Zachariadis (2017); Lv, Du & Liu (2022), while some have found that it has negative impacts (Chen 2020; Phan et al. 2020). However, impact of fintech investment on banks' performance for ASEAN countries have not yet been comprehensively studied. Due to technology development landscape in Southeast Asia being different from that of Western countries, fintech investments will have different impacts on the performance of banks in Southeast Asia. Therefore, this research aims to study and present the impact of financial technology investment on bank performance in Malaysia, Indonesia and Thailand. The objective of this research is to study the impact of financial technology investment on bank performance in Malaysia, Indonesia and Thailand.

Literature Review

Financial technology investment is defined as specific investment on technology-based innovations in the financial infrastructure as well as financial products and services (Bakar & Nordin, 2019). Among the previous studies that discussed this topic found that there is a "U"-shaped non-linear relationship between financial technology and the financial sector's performance (Wu, Bai & Chen 2022; Lv, Du & Liu 2022). According to Wu, Bai & Chen's (2022), research of 31 provinces in China from 2008 to 2018, they found that the efficiency of the financial sector depends on 3 different levels of financial technology development. In the first level (Fintech 1.0), the impact of financial technology is not significant due to the fact that financial technology at this level is only employed for the internal systems of financial institutions. In the second stage (Fintech 2.0), financial technology companies are advancing and starting to take over customers from traditional financial institutions, which causes the efficiency of the financial sector to decrease. Traditional financial institutions will then increase their fintech investment to increase their competitiveness and move to the third level of financial technology. At Fintech 3.0, increasing investments can improve the

efficiency and quality of traditional financial institutions as well as provide lower transaction costs for customers. This increases the inclusivity of financial services to the community and has an overall positive effect on the performance of the financial sector.

Lv, Du and Liu (2022), also stated that financial technology will initially reduce bank profitability because the implementation of financial technology will disrupt the supply chain between traditional banks and customers. However, when traditional banks continuously invest in financial technology, they were able to reduce costs and deliver customer satisfaction, thus increasing their profits again. The relationship that exists between bank profits and financial technology is a two-way relationship (Lv, Du & Liu 2022).

In line with the findings of Lv, Du and Liu (2022), the relationship between financial technology start-ups and banking institutions is beneficial for both parties (Li, Spigt & Swinkels 2017). For fintech start-ups, cooperation with banks can expand their market by exposing their services to bank customers (Li, Spigt & Swinkels 2017) and they also can obtain capital for their business through investment from banks (Hornuf et al. 2021). Meanwhile, for banks, they gain a competitive advantage in the financial sector through innovations in financial technology (Lee & Shin 2018) and improve the quality of their services to maximize customer satisfaction (J"unger & Mietzner 2020).

Based on previous studies that have been conducted, there are many factors that also contribute the impact of financial technology investment on bank performance. Bakar and Nordin (2019), reached the conclusion that financial technology investment will affect bank performance depending on the respective country where the banks are situated. This is because each country has its own laws and this affects the interaction between banks and financial technology (Abdul Rahim et al. 2021).

Apart from national laws, the size of a bank also affects the impact of financial technology on the banks' operations. Smaller banks report a higher improvement in their performance than large banks following the implementation of financial technology in their operations (Scott, Van Reenen & Zachariadis 2017). The implementation of financial technology into large banks shows a lower improvement in their performance because bigger banks usually have a wider branch system and the costs to synchronize the fintech applications will be higher. Large-sized banks will also experience a decline in production efficiency (Chen 2020), and output efficiency as a result of their need to coordinate operations across each extensive branch.

However, the influence of bank size on the impact of fintech investment discussed by Chen (2020), and Scott, Van Reenen and Zachariadis (2017) is only for a short period of time when financial technology is being implemented in bank operations. The impact of financial technology on bank performance will improve in the long term (Chen 2020). The benefits of fintech can be enjoyed after a few years, in line with the view that there is a "U" shaped relationship between the two elements (Wu, Bai & Chen 2022; Lv, Du & Liu 2022).

Contrary to the findings that have been explained, Phan et al (2020), conducted a study using the market value of 41 banks and found that the development of financial technology had a negative impact on bank performance. Among the two main findings of the study is

that the negative impact of financial technology is greater for larger banks than smaller banks and for state-owned banks compared to private banks (Phan et al. 2020). Both of these situations occur because large banks are slower in responding to fintech implementations (Guo & Shen 2016) and state-owned banks are slower in applying financial technology due to policy constraints.

Formation Of Hypothesis

In order to analyze the impact of financial technology investment on bank performance, this research hypothesis was formed based on the technology spillover effect theory. According to this theory, financial technology investment affects the performance of banking institutions through four ways, namely the competition effect, the demonstration effect, the personnel mobility effect and the correlation effect (Ya & Qian 2021). Because financial technology is constantly evolving, the analysis of financial technology will look at the different stages of financial technology development (Wu, Bai & Chen 2022) because each one has a different effect on banking institutions.

In the early stages of financial technology, financial technology aims to produce disruptive innovation (Wu, Bai & Chen 2022). This is because financial technology introduces easier and faster methods to carry out financial transactions. At this early stage, banks have applied financial technology in their operations but it is limited to internal operations only (Wu, Bai & Chen 2022). At this level, fintech start-ups and Internet banks are more concerned with delivering benefits to consumers, which attracts people's attention to move away from traditional financial services. This causes the competitive effect between financial technology start-ups and Internet banks with traditional banks. Traditional banks will be motivated to improve their operational efficiency (Dong et al. 2020).

Next, the demonstration effect resulted in traditional banks taking steps to increase investment in fintech with the aim of being able to take advantage of the benefits offered by financial technology for their banking operations. Financial technology has the ability to increase the competitiveness of traditional banks by offering more efficient, faster and more convenient service to customers. Financial technology can also benefit banks by reducing administrative costs (Guo & Shen 2016) and lower financial transaction costs for customers. The increased investment in fintech tech has successfully resulted in the integration of emerging financial technology with traditional financial services, in line with the correlation effect. The bank's performance will increase in line with the efficiency of the service offered. Their customer market will also expand, including customers who previously had no access to banking services (Chen, 2020). Furthermore, with the continued investment in financial technology, such integration produces long-term positive effects on the performance of the banks.

According to the technology spillover effect discussed, it is seen that the development of fintech brings a negative impact initially but, in a long term, bank performance will improve. Investment in financial technology will lead to the development of financial technology and will have a significant impact on bank performance. Therefore, the following hypothesis was formed:

Fintech investment has a significant impact on banks’ performance

Methodology

This research uses data from 6 banks from Malaysia, Indonesia and Thailand for a period of 10 years from 2012 to 2021. The sample banks selected for Malaysia are CIMB Bank and RHB Bank. The sample banks selected for Thailand are TMBThanachart Bank and Kiatnakin Phatra Bank while the sample banks selected for Indonesia are Bank Danamon and Bank Rakyat Indonesia. The banks are selected based on the availability of data as well as the market value of each bank. The selected countries are the focus of this study, which are Southeast Asian countries. Annual data for the 10-year period for the banks is obtained from the financial statements of their respective banks. The data was analyzed using the multiple linear regression method. The model for this study is illustrated in Figure 3.1.

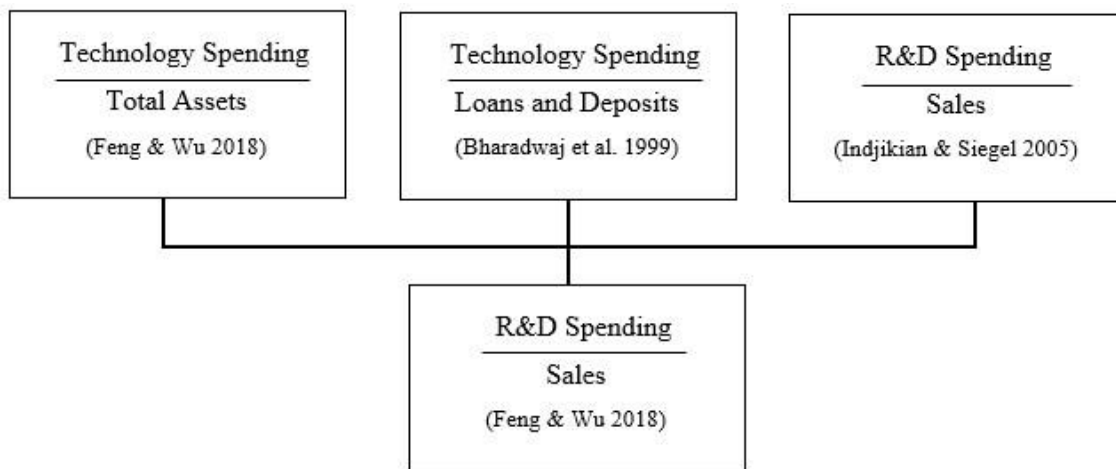


Figure 3.1 Research Model

Model Equation

$$MK_{it} = \alpha_{it} + \beta_1 PTJA_{it} + \beta_2 PTDP_{it} + \beta_3 PRDJ_{it} + \epsilon_{it} \quad \dots(3.1)$$

Where,

MK_{it} = Banks’ Performance (Profit Margin) α

= Constant value

β_1 = Coefficient of Technology Spending/Total Assets $PTJA$ =

Technology Spending/Total Assets

β_2 = Coefficient of Technology Spending/Loans and Deposits

$PTDP$ = Technology Spending/Loans and Deposits β_3 =

Coefficient of R&D Spending/Sales

$PRDJ$ = R&D Spending/Sales

ϵ_{it} = Error term

Results And Discussion

The following tables present the results of the multiple linear regression analysis based on model equation 3.1 below:

$$MK_{it} = \alpha_{it} + \beta_1 PTJA_{it} + \beta_2 PTDP_{it} + \beta_3 PRDJ_{it} + \epsilon_{it} \quad \dots(3.1)$$

Based on Table 4.1, Indonesia reported the highest R^2 value of 0.938, followed by the pooled sample, Malaysia and Thailand. For Indonesia, 93.8 percent of the variance in profit margin is explained by the three independent variables tested. The linear model for Indonesia is overall significant at the 1% level. The linear model for the pooled sample, Malaysia and Thailand is also significant at the 1% level.

Table 4.1
Model Summary

Variables	Pooled Sample	Malaysia	Indonesia	Thailand
R2	0.691	0.659	0.938	0.595
Adjusted R²	0.675	0.595	0.926	0.519
Standard Error	0.221	0.122	0.133	0.161
F-Stat	41.812***	10.296***	80.400***	7.829***
Durbin Watson	0.924	0.542	1.353	0.820

Notes: *** significant at 1%, ** significant at 5%, * significant at 10%

Table 4.2 below displays the beta coefficients produced from model 3.1 in this study. The beta coefficient shows the degree of change in the dependent variable for each unit change in the independent variable. For the pooled sample, the coefficient for PTJA and PTDP is not significant while the coefficient for PRDJ is statistically significant ($\beta = -0.305$) at the 1% level. This shows that each unit increase in R&D expenditure will reduce the profit margin by 0.305 units. When banks invest in financial technology, their research and development departments will be allocated expenses in an effort to develop and implement financial technology in the operation of the banks. However, the negative coefficient value for the pooled sample shows that spending in R&D has not been able to increase the bank's profit margin, in fact the bank's profit margin is found to decrease. Thus, financial technology investment for the pooled sample significantly lowers bank performance.

Table 4.2 also reports that the PRDJ coefficient for Malaysia ($\beta=-3.033$), Indonesia ($\beta=-0.438$) and Thailand ($\beta=-2.661$) is significant at the 1% level. The PRDJ coefficient value for each sample is negative, which means that each unit increase in PRDJ causes a decrease in the profit margin for the respective samples by the value of the respective PRDJ coefficient. In line with the findings for the pooled sample, this study found that the R&D expenditure of banks in each of the countries studied caused the bank's profit margin to decrease. Therefore, investment in financial technology in the three countries was found to be unable to improve bank performance.

Table 4.2

Model 3.1 Analysis Results

Variables	Pooled Sample	Malaysia	Indonesia	Thailand
Technology Spending/Total Assets (PTJA)	0.944	-8.171**	-1.703	2.263***
Technology Spending/Loans & Deposits (PTDP)	-0.735	7.659**	2.097	-2.220***
R&D Spending/Sales (PRDJ)	-0.305***	-3.033***	-0.438**	-2.661***

Notes: *** significant at 1%, ** significant at 5%, * significant at 10%

The negative and significant values of the PRDJ coefficient for each sample can be explained by the technology spillover effect theory (Wu, Bai & Chen, 2022).

According to the demonstration effect in the spillover effect theory, in the early stages of fintech development, fintech start-ups and Internet banks offers more benefits to consumers and this draws traditional banks customers towards them. The growing demand for more efficient service also pushes traditional banks to innovate their services. Traditional banks will then increase their investment in financial technology to increase their competitive advantage. They will allocate high expenses for the effort and they are in the stage of implementing financial technology into their operations. As such, the banks' investment in financial technology in terms of research and development has not yet brought them profit and this is shown by the negative values of the PRDJ coefficient for each sample. This is in line with the findings that the development of financial technology for Malaysia and Thailand is still in its early stages but is developing rapidly (Huong, Pua & Chong, 2021).

In addition, the results of the analysis in this study only reports the impact of fintech investment in the short term, which is for a period of 10 years only. Most banks make investments with the aim of increasing profits in the long term as well as considering the potentials for their sector in the future. Therefore, although financial technology investment produces negative impact on banks' performance as found by this study, this result is not necessarily true for the long term. This is also because the discussion above explains that the countries studied are in the early stages of the development of financial technology. Therefore, financial technology investment in the short term reduces bank profit margins but it has the opportunity to change in a positive direction as found in the study of (Wu, Bai and Chen 2022; and Lv, Du and Liu, 2022).

The value of the resulting technology expenditure ratio (PRDJ) also shows the extent to which technology has been applied in the banks' operations. Therefore, the results of the analysis are different because each bank has its own policy (Bakar & Nordin 2019) which impacts the way fintech is implemented in the operations of each respective bank.

Conclusion

This study was conducted to examine the impact of financial technology investment on banks' performance in Malaysia, Indonesia and Thailand. This study was conducted by analyzing the data of 6 banks from those countries for a period of 10 years using multiple linear regression analysis. Investment in financial technology is measured using the technology expenditure ratio as well as the research and development intensity while bank performance is measured by the profit margin of the banks. The results of the analysis on the pooled sample is the main focus of the study in examining the impact of fintech investment on bank performance. The coefficient of research and development intensity is statistically significant and also has a negative relationship with profit margin. Therefore, the results of the pooled sample analysis found that there is sufficient statistical evidence to reject the null hypothesis and found that investment in financial technology has a significant effect on bank performance. The findings of this study are consistent with the findings of (Wu, Bai and Chen 2022; and Lv, Du and Liu, 2022). However, when the analysis of the same model was carried out on a sample of Malaysia, Indonesia and Thailand, it was found that the results differed between each country. This is due to the level of development of financial technology that is different between the countries as well as their respective bank policies. Continuous investment towards the development of financial technology can encourage innovations in the sector thereby increasing the efficiency of financial technology in the market. Increasingly advanced financial technology will be able to be absorbed by banks and subsequently improve their performance (Li, Spigt and Swinkels 2017). Therefore, banks should be aware of their goals when they invest towards financial technology because those investments will give long-term returns. They should also examine the risks faced in such investments such as reduced profit margins at the initial stage, different national laws and the security risks towards their customers. In conclusion, banks that want to invest in financial technology must formulate their long-term investment plan that examines the goals, opportunities and risks to their respective businesses. Further research in this topic that includes a larger sample of banks and a longer observation period is needed.

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