Fintech: The Impact of TechnologicalInnovation on the Performance of Banking Companies

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Abstract

Financial Technology is an innovation in technology-based finance that aims to increase effectiveness for both users and banks. It is hoped that the application of Fintech will improve banking performance and values from the investors' side. This study aims to determine the effect of the presence of Financial Technology, which is assessed through four Financial Technology products, there are Mobile Payment, Mobile Banking, Internet Banking and ATM on banking performance as measured using return on assets (ROA) which in turn has an impact on banking value as measured by using Tobin's Q. This study uses twenty-three (23) banks listed on the Indonesia Stock Exchange (IDX) and issued Financial Technology products in the 2018 and 2019 periods using linear regression mediation analysis with Causal Step Approach. The results showed that the Financial Technology products, there are Mobile Banking, Internet Banking, and ATMs had a significant effect on banking value and performance, while Mobile Payment did not have a significant effect on banking value and performance.

Keywords
Mobile banking, internet banking, mobile payment, ROA, Tobin's Q

1. Introduction
In the current digital and globalization era, all human activities cannot be separated from the use of technology.Almost all activities carried out in today's life take advantage of technological developments, including in the financial sector such as banking. Innovations and technology used in this sector are often referred to as Financial Technology. Financial Technology, which is often referred to as Fintech according to the Financial Services Authority (OJK), is defined as an innovation in the financial services industry that utilizes the use of technology. Fintech products are usually in the form of a system built to carry out specific financial transaction mechanisms. Fintech is a system and innovation in the financial or financial sector with a touch of modern technology (Lee and Shin, 2016).

The development of Fintech in the country occurred as a positive impact that was received by both banks and thepublic. Fintech can reduce the number of loans that have high interest. This happens because, with the existence of Fintech, people have guaranteed and safe financial management because in general companies and banks that use Fintech have been registered with the Financial Services Authority (OJK).

Fintech also has a big impact on Micro, Small, and Medium Enterprises (MSMEs) because, with the existence ofFintech, business players get capital loans with lower interest rates compared to traditional banks. One of the systems used in this case is Peer-to-Peer Lending. Fintech as a whole has a positive impact on Micro, Small, and Medium Enterprises (MSMEs) in obtaining low-interest capital to maintain and improve their business, which leads to crowdfunding and peer to peer lending systems (Ardiansyah, 2019).

The rapid development of Fintech in Indonesia has encouraged conventional banks to keep up with technological developments by making several innovations, for example, Bank Central Asia (BCA) issued a mobile BCA product, klik BCA, FLAZZ. This is following the theory of market power put forward by Mankiw N. Gregory (2016) which states that market players with perfectly competitive market conditions do not have market power so they must follow market desires. In addition, it is also closely related to the diffusion of innovation theory proposed

by Everett Rogers (2019) which states that innovation is an idea, practice, or object that is considered new by humans or other adoption units. This theory holds that an innovation diffuses throughout society in a predictable pattern.

Previous research on Fintech on banking performance and value was conducted by Dinh et al (2018) which stated that it was found that Fintech impairs bank performance so it can be concluded that Fintech has no significant effect on Bank performance. Similar research was also conducted by Serge et al (2019) who stated that it was found thatFintech had a positive effect on bank performance. The results of research on the influence of Fintech on bank performance and value, provide varied and different results from one another. Therefore, further research is needed in the hope of explaining the influence of Fintech on bank performance and value, in more depth. However, not many studies on Financial Technology have been conducted in Indonesia, some existing studies also have differences in the measurement variables of Financial Technology, most of the previous studies only used one of the Financial Technology products, while this research uses four financial products. Technology. This research is also different from the previous one because the researcher tries to see from two sides, namely the internal side (Bank) and the external side(Investor).

Objectives:

The objectives of this study are as follows:

1. Determine the effect of mobile payment ownership in banks on Tobin's Q through ROA.
2. Determine the effect of the number of internet banking transactions on Tobin's Q through ROA.
3. Determine the effect of the number of mobile banking transactions on Tobin's Q through ROA.
4. Determine the effect of the number of ATMs owned by banks on Tobin's Q through ROA.
5. Determine the role of ROA as an intervening mediating variable between the application of Financial Technology to banking value as measured by Tobin's Q.

2. Literature Review

Dinh, et.al., (2018) Determined the impact of Financial Technology on Bank Performance as seen from the *Price Earnings Ratio* (PER) using the regression method by comparing model 1 (without the Fintech variable) and model 2 (including the Fintech variable) where Fintech was found to be proven. negative impact on 4 test variables, namely NIM, ROA, ROE, YEA. So it can be concluded that Fintech has no significant effect on the Bank's performance(PER).

Meifanga, et.al., (2018) conducted a similar study entitled *"Impact of payment technology innovations on the traditional financial industry: A focus on China"* which aims to examine the impact of Fintech *(E-Commerce and mobile and internet payment)* on Traditional Industry (Traditional Payment). With data from 73 companies related to financial companies in China from 2007-2014, it shows that there is a positive relationship between the independent variable (TPP) and the dependent variable (EVA). The researcher concludes that *traditional payments* cannot be used for *e-commerce*.

Tunay, Necla & Akhisar (2015) in their research attempted to determine the relationship between *Internet Payment* and Banking Performance using banking data from 30 countries in Europe for the period 2005-2013. The parameters for measuring the performance and performance of banks in this study use ROA and ROE with the results showing that *internet payment* and banking performance have a very strong relationship. This study also shows that the relationship of *internet payment is* significant to bank performance in all samples.

Bagudu, Khan & Roslan (2016) examined the effect of *mobile banking* on the performance of 22 commercial banks in Nigeria which showed that *mobile banking* had a positive and significant effect in influencing the financial performance of commercial banks in Nigeria. Bagudu et.al. recommended that commercial banks should continue to adopt *mobile banking* in running their business because users' *mobile payments* are always increasing every year.

Abdullai (2018) Determines the effect of *Internet Banking* on the performance of commercial bank operations in Nakuru, Kenya using the methodologies *Bank Focus Theory* and TAMwith the results of research that *Internet Banking* has a positive and significant effect on the operational performance of commercial banks. The researcher also recommends commercial banks invest in internet banking, because internet banking positively affects operational performance

Abasimi et.al (2018) Determined the effect of the number of ATMs, Micro and *Retail Banking*, the salary of directors, and NII on the health of the bank. Yulianto et.al., used the RGEC method through NPL and ROA mediation and was carried out in the banking industry in Indonesia in the period 2011-2014 which was taken from the Financial Services Authority (OJK) data. Researchers conclude that the number of ATMs and ROA influences RGEC (*Risk, Profile*, GCG, *Earning, Capital*).

Jagtiani & Lemieux (2018) Determine whether *Financial Technology* will meet the people's loan needs which have not been widely met by banks. This study uses data taken from LendingClub from 2010-2016 (which is Fintech *Consumer Lending*). To compare with LendingClub, the researcher also uses data from *Traditional Bank, namely the Federal Reserve's Y-14 Reports*. From the research results, it was found that Fintech or Fintech Loans can fill *gaps* that cannot be filled by banks to the public, especially when the economy is in a recession or weak condition. When compared using R-Square, it is found that for all of the variables being compared, LendingClub is always higher than *Traditional Bank (Local bank Y-14 Reports)*.

This statement is directly proportional to the research conducted by Liua, Tripeb, Jianga, Liua, & Chena 2018 which concluded that with the development of Fintech or innovation in the financial world, the risks faced by traditional banks will increase along with the shift in an increasingly modern lifestyle. In line with previous research, Temelkov, 2018 found that the existence and development of Fintech will be a threat to traditional banks that do not go out of their comfort zone and will be huge opportunities and opportunities for banks that want to develop and get out of their comfort zone by entering into technology market and innovation in finance or Fintech.

3. Methods

The research design scheme in this study is shown in Figure 1 below as follows:

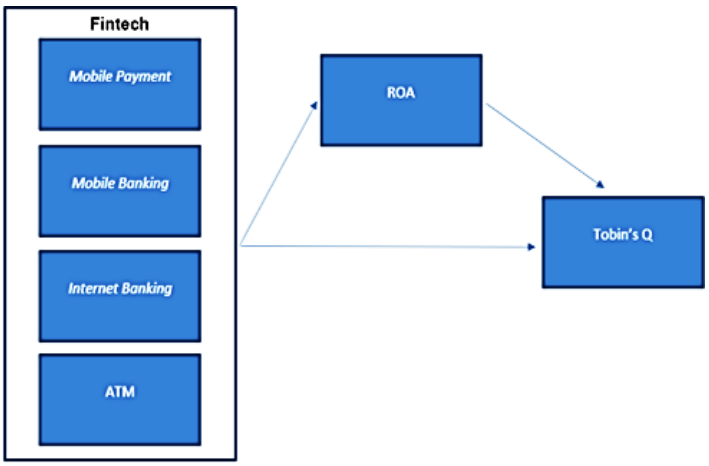

Figure 1. Research Model

Hypothesis testing uses linear regression analysis with the mediation variables Determined using software Process Macro by Hayes SPSS. The implementation of FinTech will be measured through 4 banking product innovation variables, namely: mobile payment, mobile banking, internet banking, and the number of ATMs. The mediating variable is banking performance as measured using ROA and firm value measured by Tobin's Q. Before testing, to ensure that the data fits the model fit, a classic assumption test will be carried out.

4. Data Collection

This study uses secondary data obtained through information from the annual financial statements of banks listed on the Indonesia Stock Exchange (BEI) 2018-2019. Until 2019, the number of banking companies that have been listed on the Indonesia Stock Exchange is 43 companies, while those that will be the research subjects in this study are banks that have the following criteria:

1. Is a banking company.

2. The bank is a public company that has been listed on the Indonesia Stock Exchange (IDX) at the end of 2019.

3. The Bank has an annual financial report that has been audited by an independent auditor to strengthen the validity of the report.

4. The bank has data on the number of mobile banking transactions, the number of internet banking transactions, and the number of ATMs owned by the bank.

Of the 43 registered banks, 23 banks meet the criteria regarding FinTech to be research subjects.

5. Results and Discussion

5.1 Descriptive Analysis

Based on the summary of the table 1 above, MB (Mobile Banking) has an average of 40,186 thousand transactions with a standard deviation of 78,622 thousand transactions. A fairly high standard deviation value occurs as a result of the fairly large range or range of the number of Mobile Banking transactions among the research subjects. The minimum number of Mobile Banking transactions is obtained by PT Bank Ganesha Tbk. (BGTG) in 2018, while the maximum number of Mobile Banking transactions was obtained by PT Bank Rakyat Indonesia Persero Tbk. (BBRI) in 2019.

Internet Banking had an average of 129,417 thousand transactions, greater than the number of mobile banking transactions. A large number of Internet Banking transactions compared to Mobile Banking occurred because the Internet was found much earlier than Smartphones, which are the media for Mobile Banking. The Internet itself entered Indonesia in 1990 while Smartphones entered Indonesia in 2007 so that Internet Banking has been invented first and has gained users first compared to Mobile Banking which is the latest innovation from Internet Banking.

Table 1. Descriptive Statistical Analysis

VARIABLE	MINIMUM	MAXIMUM	MEAN	STANDARD DEVIATION
Mobile Banking (In Thausand of Transaction)	0.127	370,500	40,186	78,622
Internet Banking (In Thausand of Transaction)	1.680	1,169,400	129,417	287,849
ATM (Unit)	12,834	212,622	87,288	51,867
Return on Assets	0.002	0.0295	0.0109	0.0085
Tobin's Q	0.853	1.2388	0.9929	0.0847

The lowest number of Internet Banking transactions is PT Ganesha Tbk. (BGTG) in 2018 which launched G- Online in 2017 and can be categorized as a newcomer to the digital banking world. Meanwhile, the highest number of Internet Banking transactions is Bank Rakyat Indonesia Tbk. (BBRI) in 2019 which launched BRI Internet Banking in around 2006 and is one of the fastest banks to enter the digital world in Indonesia.

ATMs have an average of 87,288 units. Bank Bukopin Tbk has the least number of ATM units. (BBKP) in 2019, which had 12,834 units throughout Indonesia, decreased by 33 units from 2018. The coverage of Bank Bukopin's customers, which was not widespread plus the few Bukopin ATMs available at Bank Prima, made the number of Bank Bukopin's ATMs very small compared to other banks. in the research subject this time. Meanwhile, the highest number ofATMs is owned by Bank Negara Indonesia Persero Tbk. (BBNI) in 2019 with a total of 212,622 units throughout Indonesia, including those connected to ATM Prima and ATM Bersama. The large number of ATMs owned by BBNI is inseparable from its responsibility as one of the State-owned Banks of the Republic of Indonesia, so it must spread as many ATM units as possible so that all BBNI customers and Indonesian people can be reached for transactions,

plus, there are several payments must be made by the people. Indonesia to the state through BBNI such as motor vehicle ticket payments and also payment of tuition fees at state-owned universities.

In this study, ROA has a mean of 0.0109 with a standard deviation of 0.0085. The subject with the lowestROA was Bank Artha Graha Internasional Tbk in 2019 (INPC) while the highest ROA was obtained by Bank Rakyat Indonesia Persero Tbk. (BBRI) in 2019. A large number of customers and users of BBRI's digital platform and the soaring market capitalization value from 2017 to 2018 made banking assets and profits lifted and resulted in high ROA. In addition, the CASA ratio or Current Account Saving Account owned by BBRI is classified as very large, reaching 58%, which in the end has the potential to generate profits from lending made. Meanwhile, INPC must be the bank with the lowest ROA in this study.

A high Tobin's Q value indicates that the market values the company as higher than its asset value (overvalued) and vice versa. In this study, Q has a mean of 0.9929 with a standard deviation of 0.0847. The lowest Q value is owned by Bank Artha Graha Internasional Tbk. (INPC) and the highest Q value is owned by Bank Rakyat Indonesia Persero Tbk. (BBRI). This indicates that BBRI is overvalued and INPC is undervalued.

5.2 Classic Assumption Test

In analyzing the classical assumption test, the researcher transformed data for the variables Mobile Banking, Internet Banking, and ATM using Log. This is done because the data in the research subject has a range fairly wide between variables so that it can cause errors and a large range that will result in abnormal research data, after transforming, the researcher performs a classical assumption test to be able to produce the best regression model or BLUE (Best Linear Unbiased Estimator).

5.2.1 Autocorrelation Test

This test is performed to ensure that the *error term* regression in a period is uncorrelated.

Table 2. Autocorrelation Test Results

R	R SQUARE	ADJUSTED R SQUARE	STD. ERROR OF THE ESTIMATE	DURBIN WATSON
0.614	0.377	0.285	0.0724865	1.89

The Durbin-Watson value is 1,890, while the values *Durbin Upper* and *Durbin Lower* for the amount of data are 40 and the number of independent variables is 4, respectively, 1.7209 and 1.2848.

The results of this autocorrelation can be explained in the Figure 2 below:

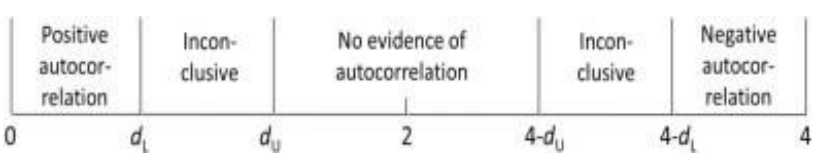

Figure 2. Autocorrelation

From the picture above, the Durbin Watson value is between the *Durbin Upper* and 4-*Durbin Upper* so it canbe concluded that there is no autocorrelation symptom.

5.2.2 Multicollinearity Test

The multicollinearity test is done by looking at the *Variance Inflation Factor* (VIF) value for each independentvariable in the regression model. Regression models that do not show symptoms of multicollinearity must have a VIF below 10, for each independent variable (Ghozali, 2016).

Table 3. Multicollinearity Test Results

Model	Unstandized Coefficients		Standardized Coefficients Beta	t	Sig	Collinearity Statistics	
	B	Std. Error				Tolerance	VIF
Constant	0.799	0.192		4.165	0		
Mobile Payment	-0.046	0.027	-0.251	-1.729	0.093	0.872	1.146
Mobile Banking	-0.019	1.533	0.445	2.906	0.006	0.781	1.281
Internet Banking	0.031	0.018	-0.36	-1.057	0.298	0.158	6.385
ATM	0.015	0.019	0.516	1.639	0.11	0.185	5.404
ROA	4.456	0.042	0.059	0.354	0.726	0.656	1.525

Through the table 3 above, all independent variables, namely *Mobile Payment, Mobile Banking, Internet Banking*, and ATM have a VIF of less than 10, including ROA which is a mediating variable. So it can be concluded thatthere are no symptoms of multicollinearity in the research model.

5.2.3 Heteroscedasticity Test

According to Imam Ghozali (2016), the basis for decision making that can be taken is if certain patterns such asexisting dots form a regular pattern (wavy, widened, narrowed) then heteroscedasticity has occurred. However, if the pattern is not clear and the dots spread above and below zero on the Y axis, there will be no heteroscedasticity.

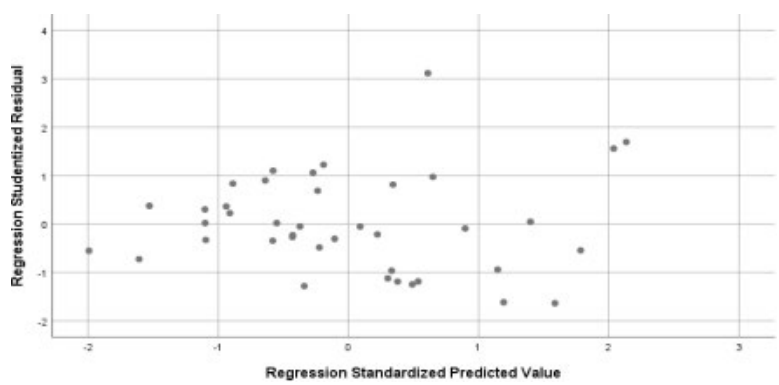

Figure 3. *Scatter Plot*

Through the scatter plot image in above Figure 3, it can be concluded that the points do not form a certain pattern (wavy, widened then narrowed) and the points in the scatter plot spread above and below zero on the Y-axis so that there is no symptom of heteroscedasticity.

5.2.4 Normality Test

Normality test can be carried out by the Kolmogorov-Smirnov test at a specified level of significance or , with the null hypothesis that the residual value is normally distributed. If the p-value of the coefficient is higher than 0.05, the null hypothesis is not rejected, and it can be concluded that there is no normality issue in the regression model.

Table 4. Kolmogorov-Smirnov Test Results

		Unstandardized Residual
N		40
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	.06768058
Most Extreme Differences	Absolute	.106
	Positive	.106
	Negative	-.050
Test Statistic		.106
Asymp. Sig. (2-tailed)		.200[c,d]

Through the table 4 above, it can be seen that the p-value in the Kolmogorov-Smirnov test above is 0.2 or greaterthan 0.05, so it can be concluded that the residuals are successfully distributed normally.

5.3 Regression through the Mediation Method

After performing the classical assumption test, the next step is to carry out linear regression analysis using mediating variables. In conducting this analysis, the authors use the causal step method processed with Process Macro byHayes at SPSS to obtain 3 paths, namely:

1. Path A = Path that connects the variables Mobile Payment, Mobile Banking, Internet Banking, and ATM to the mediating variable, namely ROA.
2. Path B = Path that connects between the mediating variables, namely ROA to Tobin's Q variable.
3. Path C' = The path that connects the variables Mobile Payment, Mobile Banking, Internet Banking, and ATM to Tobin's Q through the mediation effect or ROA.

The three pathways will produce a new line, namely line C which is the total effect of the Fintech variable on Tobin's Q through ROA. Path C can be found with the formula Path C '(Direct Effect) + AxB Path (Indirect Effect).

Table 5. Regression Results

Variable	Coef Direct Effect	Coef Indirect Effect	Coef Total Effect	P
Mobile Payment	-0.0490	0.0021	-0.0469	0.1139
Mobile Banking	0.0105	0.0088	0.0193	0.0202
Internet Banking	0.0161	0.0084	0.0245	0.0100
ATM	0.0399	0.0386	0.0785	0.0485

The variable will be significant if the P-value is lower than 0.05, so it can be said that of the 4 X variables tested, only 1 variable is insignificant, namely, Mobile Payment, while the other three variables, namely Mobile Banking, Internet Banking, and ATM have a significant effect on Tobin's Q through ROA.

6. Conclusions

The results of this study can be concluded as follows:

1. Mobile Banking, Internet Banking, ATMs have a significant impact on Tobin's Q through ROA so that the higher the transaction value that occurs in Mobile Banking and Internet Banking and the greater the number of ATMs in circulation, the banking value and banking performance will also increase.
2. Mobile Payment does not affect value (Tobin's Q) and banking performance (ROA).

Mobile Payment is not influential because mobile payment is an innovation in the financial sector or Fintech, which was most recently discovered in 2007, which was initiated by Telkomsel for the first time by issuing T-Cash. Until 2012, banks began to actively explore the Mobile Payment market such as BCA which issued Sakuku and Flazz, Mandiri which issued Mandiri E-Cash, and many others. As one of the youngest innovations in the financial sector in Indonesia, the development of Mobile Payment is quite rapid in 2019, namely around 16.4 billion US dollars, or an increase of 3 times compared to 2018. This proves that the development of Mobile Payment is very fast and is starting toget attention. by the Indonesian people with various conveniences and practicalities they have (Aldiabat et al., 2018). In addition, banks are also required to compete with other non-bank companies that have already issued mobile payment service products, thus making the competition in the mobile payment market very busy.

Meanwhile, Mobile Banking, Internet Banking, and ATMs succeeded in having a significant influence on Tobin's Q through ROA because currently, Mobile Banking has become an important factor for every bank due to the very high and growing number of Smartphone users. The growing market for the Internet and Smartphones makes mobile banking a valuable asset and investment for every bank that owns it. With Mobile Banking, benefits will be obtained for both parties, both banks, and customers. For customers, the existence of Mobile Banking provided by banks will provide effectiveness and time efficiency, this happens because customers can do banking services online or online anywhere and anytime without having to come directly to the bank so they don't waste material or time. This efficiency will also have a positive impact on banking. By presenting Mobile Banking, banks can increase customer loyalty with the convenience it provides.

So, it is with Internet Banking, Internet Banking which is one of the oldest innovations in the financial sector adopted by banking has certainly provided many users to date, with the presence of Internet Banking, customers who want fast and comfortable service will certainly be satisfied by the presence of Internet Banking. In addition, the level ofsecurity provided by Internet Banking by providing Internet Banking Tokens before the transaction takes place providesa high sense of security for its customers, because money is a sensitive matter and is the point that most humans pay attention to.

And the last is ATM, the presence of an ATM itself functions to replace services that occur in banks so that customers can perform bank services independently with an ATM. The presence of ATMs is proven to increase customer satisfaction because customers do not need to sacrifice waiting time at the bank to make transfer transactions orwithdraw money. After all, with an ATM this can be done quickly and practically. The large number of ATMs spreadby banks indicates a wide spread of customers so that the intensity of customers in conducting transactions at these banks is high. Thus, ATMs can make it easier for customers to make transactions for customer satisfaction.

This research is still far from perfect, therefore further research is expected to be carried out to be able to perfect it. The suggestion that the author can give for further research is that in this research, the author only uses data for 2 years, 2018 and 2019. In the future, it is better to use data for more than 2 years so that it can produce a more measurable and in-depth analysis. This study also has limitations in which to measure banking performance, researchersuse ROA, while researchers find that the CASA (Current Account Saving Account) ratio is more appropriate to be used to measure banking performance because Fintech innovation is intended to increase the CASA ratio, so for further research, it can be using the CASA ratio in measuring banking performance.

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