Impact of Financial Technology on the Financial Performance of Conventional Banks in Indonesia

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Abstract
This study intends to investigate variations in banking financial performance concurrent with Fintech expansion and to elucidate the influence of Fintech, or financial technology, on banking financial performance. Quantitative research is what this kind of study. For the years 2013 through 2020, conventional banking businesses listed on the Indonesia Stock Exchange (IDX) were the subject of this study. The Indonesia Stock Exchange's official website and the official websites of each firm provided research data in the form of yearly reports. Out of 43 data points, 22 firms made up the sample. Purposive sampling is the approach used for sampling. From the results of the Paired T Test Sample, the application of fintech has had an influence on the performance and health of conventional banking in Indonesia which is the sample in this research, although seen from the BOPO side it does not provide the same thing. According to the study's findings, fintech's rise is a disruptive innovation for the banking sector. This problem is closely correlated with people's need for financial convenience. Fintech has the potential to help banks with issues such as the unbanked population and increase financial penetration.

Keywords: financial technology; BOPO; return on assets; non-performing loan

INTRODUCTION

To begin developing accounting principles, a committee for the creation of GAAP (Generally Accepted Accounting Principles) and GAAS (Generally Accepted Auditing Standards) was established in Indonesia in 1973. When the capital market in Indonesia was activated in 1974, the Indonesian Institute of

Accountants (IAI) formed the Indonesian Accounting Principles Committee (PAI Committee) as a forum for the accounting profession and codified the accounting principles applicable in Indonesia in a book entitled "Indonesian Accounting Principles". Accounting principles must be harmonized, because each environment and culture has its own characteristics in the application of accounting. The translation of IFRS standards may result in different meanings (Budianto et al., 2023)

A new phenomenon known as Financial technologies (Fintech) has emerged at the start of the twenty-first century. Technological advances are driving the trend of economic growth towards digitalization. Bank Indonesia (2016) argues that in the financial sector, digital technology can help drive economic growth and support financial inclusion (Candraningrat, 2022). Fintech includes everything from mobile payments and internet banking to decentralized database technologies and online lending. Although the word was originally used in the 1970s, it hasn't become widely used in the current corporate vernacular until the mid-2010s (Schueffel, 2016). Online advertising, application programming interfaces, and loan screening algorithms are the new banking

models known as fintech lenders, which take the place of conventional lending relationships (Griffin et al., 2023).

With the arrival of electronic financial service providers/financial technology (Fintech), the business world is growing very rapidly and penetrating the financial industry. Payment transactions, investments, money lending, remittances, financial planning and financial product comparisons are some of the financial transactions conducted through Fintech. The Financial Services Authority (OJK), an independent institution that has the power, function and authority to regulate, supervise, audit and monitor, is responsible for conducting supervision. Law No. 21 of 2011 is the basis for the establishment of OJK. It aims to establish a holistic system to regulate and supervise all activities in the financial services sector. The regulations for the implementation of financial technology are Regulation No. 19/12/PBI/2017 from Bank Indonesia and No. 77/POJK.01/2016 from the Financial Services Authority (POJK) on Information Technology-Based Money Lending and Borrowing Services (LPMUBTI).

Technology-based financial service innovations have been developing in various countries to

facilitate the use of fintech services. Areas such as payment systems, financing, wealth management, and microenterprise financing are some of the emerging fintech innovations. Among the things that are very important for business people to consider are technologies that were previously underestimated and considered not to have a significant impact on the business world (Zein, 2019).

The broad definition of fintech is the use of information technology in the design and provision of financial services and products (Leong et al., 2017). Fintech is currently working on financial application tools that provide various financial facilities needed by society (Nakashima, 2018). Fintech refers to the application of digital technology to financial intermediary issues (Aaron et al., 2017). These developments in technology undoubtedly provide better access to money, alternate payment methods, and financial management. But little is known about how new technologies could affect household financial health, in terms of both dangers and rewards (Danisewicz & Elard, 2023). Fintech enhances financial institutions' operational efficiency and broadens the scope and depth of their offerings (Currie & Lagoarde-Segot, 2017). Because fintech increases the

speed and openness of financial information, it may help entrepreneurs find and seize new business possibilities (Gozman et al., 2018). OJK Regulation No. 77/2016 on Information Technology-Based Money Lending and Borrowing Services authorizes the Financial Services Authority (OJK) to regulate lending and borrowing through Fintech services. Peer-to-peer lending, internet lending, and fintech lending are terms used to describe an information technology-based direct lending and borrowing service in rupiah currency between creditors and borrowers (Financial Services Authority, 2016).

According to CB Insights, global financing for fintech will reach USD 132 billion by 2021 (Figure 1). At first glance, the USD 132 billion fintech sector looks like peanuts, as the largest banks have nearly USD 17 trillion in assets. However, the growth of fintech also makes it possible for more innovation to provide financial services that are more efficient than those provided by traditional banking, therefore the banking sector may suffer as a result of fintech's existence (C.F.A Institute, 2016). Fintech has the potential to supplant conventional banking services by means of online peer-to-peer (P2P) lending platforms that do not impose stringent credit
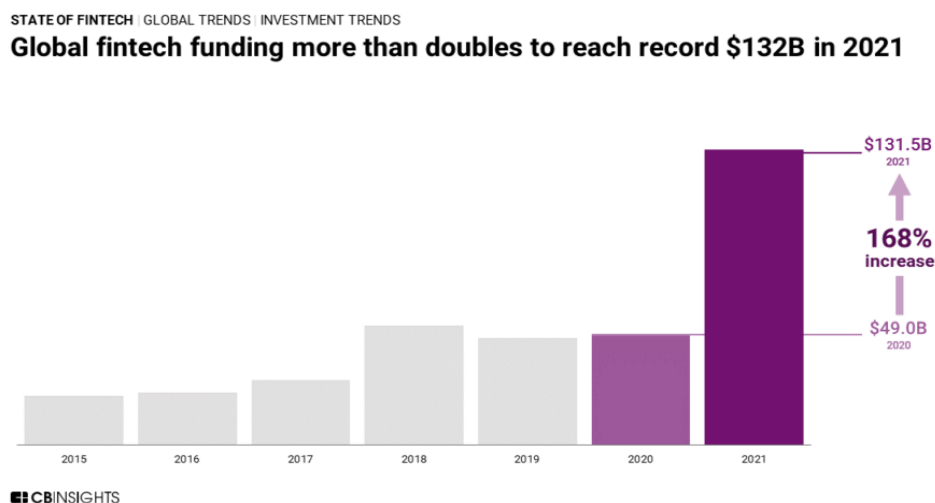
STATE OF FINTECH | GLOBAL TRENDS | INVESTMENT TRENDS

Global fintech funding more than doubles to reach record $132B in 2021

$131.5B
2021

168%
increase

$49.0B
2020

2015   2016   2017   2018   2019   2020   2021

CBINSIGHTS
1

Figure 1. The Growth of Global Fintech Funding (2015-2021)

criteria on borrowers (Tang, 2019). Bank supervisors thus require a regulatory framework to guarantee the stability and safety of banks while also improving consumer protection by lowering the possibility of rivalry between Fintechs and banks. According to recent studies, the financial sector is becoming more dynamic and sophisticated (Lestari et al., 2022), thus it is crucial to keep an eye on how financial institutions' shifting dynamics and their relationships with new technologies are being examined. These results demonstrate the necessity of more stringent laws for technological corporations, such to those governing banks (Nguyen et al., 2022).

Because it acts as a financial middleman between those with extra money and those in need of money,

the banking sector is one that is crucial to the prosperity of a country (Kusumawati & Mahastanti, 2023). The financial accounts of the firm provide information about its performance. A statement of financial position, a statement of comprehensive income, a cash flow statement, a statement of changes in equity, and notes to financial statements make up the company's financial statements. A business that makes large profits during a specific time frame may not be as excellent later on if its current asset and fixed asset ratios are not doing well (Goh et al., 2022). One major benefit of using fintech as a payment method in transactions is that it may make payments for such transactions simpler and less expensive (Alfian et al., 2023)

Generally speaking, the banking and financial services sector has been impacted by the tsunami of digital disruption that has come. This is a significant makeover of the retail banking model overall, as the entire market structure will shift, rather than merely a significant technology change or the inclusion of new channels quality of services (Ferarri, 2016). According to Milian et al., (2019) states that fintech consists of two aspects, namely financial and technology. According to Pollari, (2016), it is frequently exaggerated that the number of Fintech startups increasing competition in the banking sector. This is due to the fact that many Fintech businesses collaborate with financial institutions, but only established Fintech businesses have the ability to completely replace established financial businesses. According to Christensen, (1997) Successful newcomers can go for undiscovered markets. This idea implies that Fintech businesses operate in tiny loan sectors that do not generate enough profit for traditional banks, which has implications for Fintech development. Haddad & Hornuf, (2019) Give empirical data from various nations and emphasize that industrialized nations and those with a greater number of venture capitalists tend to have higher levels of Fintech growth. Moreover, there are more Fintech startups in areas with stronger technology infrastructure, a larger labor population, and restricted access to bank financing.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT
Disruption of Innovations by. Rogers

Disruption is the process by which members of a social system spread an innovation over time through specific channels (Rogers, 2003). Diffusion is a particular form of communication in which stories are spread that are perceived as novel concepts. In the communication process, the participants create information and exchange it with each other in order to reach an understanding. As the idea contained in the messages is new, the diffusion has a unique character. Some uncertainty and perceived risk are involved in the dissemination process. An individual can reduce this level of uncertainty by acquiring information. A difference in matter energy called information influences the uncertainty in a situation where one has to choose between different alternatives.

The main elements in the diffusion of new ideas are: (1) an innovation (2) that is communicate

through certain channels (3) over time (4) among the members of a social system.

Innovation

An innovation represents an idea, process or object that is adopted by an individual or another entity. The majority of new ideas discussed are technological innovations. A technology refers to a method of instrumental action that resolves uncertainty in the relationship between cause and effect. Relationships that are necessary to achieve a desired result. Most technologies have two main components: (1) hardware, which comprises the instrument that represents the technology as a physical or material object, and (2) software, which forms the knowledge base for the instrument.

Relationships that are necessary to achieve a desired result. Most technologies have two main components: (1) hardware, which comprises the instrument that represents the technology as a physical or material object, and (2) software, which forms the knowledge base for the instrument. The extent to which an innovation is changed or modified in the process of adoption and implementation by a user is referred to as reinvention.

Communication Channels

A communication channel is used to transmit messages from one person to the next. Mass media are better at conveying knowledge about innovations, while interpersonal channels are better at shaping and changing attitudes towards a new idea, and thus influencing the decision whether to accept or reject a new idea. Most people judge an innovation not on the basis of scientific studies by experts, but on the personal evaluations of peers who have adopted it. Therefore, these peers act as role models whose innovative behavior tends to be imitated by others in their system.

A typical characteristic of diffusion is that there is usually a certain heterophily in communication about innovations. Heterophily occurs when two or more people interacting with each other have different characteristics, such as beliefs, education, social status and the like. Homophily is the opposite of heterophily, meaning that two or more people who interact with each other share certain characteristics. Most human communication takes place between homophilic individuals, which results in more effective communication. Therefore, heterophily, which can often occur when innovations are disseminated,

presents particular difficulties in achieving effective communication.

Time

Time is involved in diffusion in (1) the innovation-diffusion process, (2) innovativeness, and (3) an innovation's rate of adoption. The innovation-decision process is the process through which an individual (or other decision-making unit) passes from first knowledge of an innovation to forming an attitude toward the innovation, to a decision to adopt or reject, to implementation of the new idea, and to confirmation of this decision. We conceptualize five steps in this process: (1) knowledge, (2) persuasion, (3) decision, (4) implementation, and (5) confirmation. An individual seeks information at various stages in the innovation-decision process in order to decrease uncertainty about an innovation's expected consequences. The decision stage leads (1) to adoption, a decision to make full use of an innovation as the best course of action available, or (2) to rejection, a decision not to adopt an innovation.

Innovativeness is the degree to which an individual or other unit of adoption is relatively earlier in adopting new ideas than other members of a social system. We specify five adopter categories, classifications of the members of a social system on the basis of their innovativeness: (1) innovators, (2) early adopters, (3) early majority, (4) late majority, and (5) laggards. The rate of adoption is the relative speed with which an innovation is adopted by members of a social system.

System Social

In order to achieve a common goal, a social system is a group of interconnected units that work together to solve problems. The structure of a system is the patterned arrangement of units in a system as well as the regularity and stability of individual behavior. The social and communicative structure of a system makes it easier or more difficult to disseminate innovations in this system. Norms are part of the social structure and determine the behavior of social system members. Opinion leadership refers to the extent to which a person can influence the attitudes or overt behavior of others in a desired way. A change agent is someone who strives to guide the innovation decisions of their clients in a way that is considered desirable by a change agency.

A helper is a less professional change agent who works intensively with customers to influence their innovation decisions. We classify

three main types of innovation decisions:

(1) Facultative innovation decisions: These are decisions made by one person independently of the decisions made by other members of the system.

(2) Collective innovation decisions: These are decisions to accept or reject an innovation.

(3) Authoritarian innovation decisions: Decisions to adopt or reject an innovation that are made by relatively few people in a system who have power, status, or technical expertise, as well as innovations that are made by consensus among the members of a system.

Contingent innovation decisions are decisions to accept or reject that are only made after a previous innovation decision. They form a fourth category consisting of two or more of these three types of innovation decisions. A final way in which a social system affects diffusion is through consequences, i.e., the changes that occur for a person or a social system as a result of accepting or rejecting an innovation.

Financial Technology

The word financial technology, or fintech, is derived from this. Fintech is defined as "innovation infinancial services" or "innovation in Fintech financial services" by The National Digital Research Center (NDRC), located in Dublin, Ireland. It is a term used to describe innovations in the financial industry that include contemporary technology. Fintech facilitates financial activities such as transfers, investments, money loans, payments, financial plans, and product comparisons (Santi et al., 2017). Fintech is an integrated hardware and software combination that enables it to correctly mobilize funds from its consumers (Lee, 2009). Furthermore Zavolokina et al., (2016) assert that fintech will assist its users in realizing a number of advantages, including lower transaction costs, quicker access to financial data, and support for ethical corporate practices. According to Fitriani, (2018) claims that because fintech offers a variety of services from banking, insurance, and finance, it has drawn a lot of public interest. In order for individuals to continue using fintech services, particularly medium-sized firms, fintech is required.

BOPO (Operating Expenses Operating Income)

Matindas et al., (2015) imply that the bank utilizes operational expenses more effectively to operate its operations the lower the BOPO number. in order for the bank to get bigger profits and vice versa. Bank Indonesia Regulation, (2013) specifies that the Operating Expenses to Operating Income (BOPO) ratio cannot exceed 85%. When a bank's BOPO ratio is high, it indicates that its operating expenses outweigh the revenue it brings in from operations. The bank's profitability level (ROA) will be low if its operational income is low. The BOPO computation is as follows: (Devi, 2021)

$$BOPO = (Operational\ Cost)/(Operating\ Income)$$

Non-Performing Loan

Since loans are deemed "non-performing" after three months beyond maturity, financial institutions have long used the non-performing loan (NPL) ratio as a performance metric to assess the amount of delinquent loans relative to total loans (Epure & Lafuente, 2015). NPLs are thought to be a sign of how well a financial institution's loan portfolio is performing. In order to calculate the minimum reserves required for banks to write down productive assets in order to cover future losses, it is crucial to note that the NPL value cannot exceed 5% (Maulana et al., 2021). The bank has more non-performing loans the greater the Non-Performing Loan (NPL). The growing amount of non-performing loans (NPL) suggests that banks management is having trouble locating high-quality borrowers. The bank's capacity to turn a profit will be influenced by its Non-Performing Loan (NPL) ratio, which in turn will affect the share price of the bank. Investors prefer a rise in stock prices since it will boost their stock return (Nasikin & Yuliana, 2022). The following is the Non-Performing Loan formula.

$$NPL = (Bad\ Debt)/(Total\ Credit)$$

Return on Assets

A profitability ratio called return on assets (ROA) is used to assess how profitable it is to employ firm assets. The company's profitability rises and it exhibits strong corporate performance the higher the ROA (Ulfa et al., 2017). The greater the return on assets (ROA) figure, the more effective the firm is at generating profits by optimizing its assets; conversely, a lower ROA value indicates less success in generating profits and optimizing its assets. As a result, ROA is a valuable metric for evaluating how well a firm uses its assets and for

calculating profitability. This information may help a company make decisions and decide where investors should put their money (Hartini et al., 2023). The following is the ROA formula:

ROA=(Earning After Tax)/(Total Asset)

Hypothesis Development

The Difference in the BOPO Ratio Before and After the Emergence of Fintech in Indonesia

Fintech is a new financial service model used in the financial sector. The operating expense/operating income ratio (BOPO) is an indicator that compares operating expenses to operating income. The operating cost ratio is used to measure the efficiency and performance of banks in carrying out their operational activities. The BOPO ratio provides information about the operating costs that must be borne by the bank to generate its operating income.

Fintech has an impact on society as a whole as it enables access to financial products, making transactions more convenient and effective. This perspective allows banks to build collaborative relationships to increase profits. Such cooperation can attract customers, which automatically increases the number of customers. Therefore, the existence of FinTech can reduce the

administrative burden for banks. This is because the banking industry converts operating costs into operating income for all transactions because of the technology they already have.

Based on the explanation above, the hypotheses in this study are as follow:

H1: There is a significant difference in the BOPO ratio before and after the emergence of Fintech in Indonesia.

The Difference in the NPL Ratio Before and After the Emergence of Fintech in Indonesia

Financial Technology (FinTech) was created by connecting financial services and technology. This ultimately serves to improve traditional business models. Those who initially had to pay in person and carry wads of cash can now make remote transactions by making payments in seconds (Wiyono & Kusuma, 2017). NPL is one of the indicators that can be used to assess the performance of a bank. If the bank is able to determine the optimal loan limit and maximize the amount of capital available in the form of cash, then the bank can estimate high capital losses due to increased NPLs (Darmansyah & Usman, 2015). Fintech affects society as a whole by

providing access to financial products and making transactions easier and more efficient. According to this view, banks can work together to increase their profits. This collaboration can improve bank performance by attracting customers.

Based on the explanation above, the hypotheses in this study are as follow:

H2: There is a significant difference in the NPL ratio before and after the emergence of Fintech in Indonesia.

The Difference in the ROA Ratio Before and After the Emergence of Fintech in Indonesia

Fintech is a combination of hardware and software that is integrated into one so that it can mobilize funds from its users properly and conveniently (Lee, 2009). ROA is used to measure the extent to which the company is able to generate overall profits with the total assets available in the company (Pratiwi et al., 2020). Cooperation can attract customers, which will automatically increase the number of customers. An increase in the number of customers leads to an increase in third party funds collected in total bank assets, so that it can affect bank profits. This will have an impact on the percentage of return on assets (ROA).

Based on the explanation above, the hypotheses in this study are

H3: There is a significant difference in the ROA ratio before and after the emergence of Fintech in Indonesia.

METHOD

This study employed a descriptive quantitative methodology, gathering data from yearly reports, evaluating it, studying relevant topics, drawing conclusions, and so on. This study examines financial performance from 2013 to 2020 as Fintech grows using a t-test analytic technique. In order to demonstrate if Fintech is a disruption in Indonesian banking performance, differences in study results will be evaluated. Companies operating in the banking subsector make up the study's population. Purposive sampling is the technique used for sample selection. The following criteria have been established: 1) the banking subsector; 2) banks that use Fintech services; and 3) publicly available financial reports and supporting information from official websites. The secondary data used in this study came from reputable mass media stories, annual or financial reports, and a variety of periodicals. Secondary data gathering via linked companies' official websites. An event study is used in this study

to examine how the Fintech phenomena affects financial performance. In this analysis, 22 financial institutions meet the eligibility requirements.

RESULTS AND DISCUSSION

The outcomes of testing and discussion using various test analyses on 22 banks are listed below. Financial ratios serve as a stand-in for analysis of banking performance. The company's financial data are used to construct this ratio, and the four years before and four years after Fintech are the chosen time dimensions. The difference between the average value for BOPO, NPL and ROA three years after the emergence of Fintech in Indonesia and four years prior is displayed in the table of various tests that were undertaken. For each ratio, the average values are different four years before and four years after Fintech.

There is a difference between ROA before and after the Fintech phenomena, according to table 1, where the value for the paired sample t test findings reveals a significant value of 0.016, which is lower than 0.05. This indicates that conventional banking businesses listed on the Indonesia stock exchange were significantly impacted both before and after Fintech entered Indonesia. This

demonstrates that the business has expanded its activities. The rise in the ROA value demonstrates the banks' proficiency in asset management for financial gain (Kristianti & Tulenan, 2021).

The fintech phenomenon is inevitable, but banks are responding to it the phenomenon. This means that banks also offer technologically innovative financial services and evaluate their business models so that fintech start-ups do not jeopardize their existence. So that their business models are not affected by the presence of fintech start-ups, they evaluate them. The emergence of the fintech phenomenon can motivate banks to participate in information technology innovation. Banks must have a high level of innovation in technology. Information technology serves to improve financial performance (Kristianti & Tulenan, 2021). This research is not in line with Sinambela & Rohani, (2017), Kristianti & Tulenan, (2021) research which says that ROA has no influence either before or after fintech appears.

There is a difference between NPL before and after the Fintech phenomena, according to table 2, where the value for the paired sample t test findings reveals a significant value of 0.0329, which is lower than 0.05. This indicates that conventional

Table 1. Paired Samples Test—ROA

		Paired Differences							
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of Difference		t	df	Sig. (2-tailed)
					Lower	Upper			
Pair 1	4 years before Fintech—4 years after Fintech	.00318	.00568	.00121	.00066	.00570	2.268	21	.016

Table 2. Paired Samples Test—NPL

		Paired Differences							
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of Difference		t	df	Sig. (2-tailed)
					Lower	Upper			
Pair 1	4 years before Fintech—4 years after Fintech	-.46409	.98925	.21091	-.90270	-.02548	-2.200	21	.039

Table 3. Paired Samples Test—BOPO

		Paired Differences							
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of Difference		t	df	Sig. (2-tailed)
					Lower	Upper			
Pair 1	4 years before Fintech—4 years after Fintech	1.41364	12.30386	2.62319	-4.04159	6.86886	.539	21	.196

banking businesses listed on the Indonesia stock exchange were significantly impacted both before and after Fintech entered Indonesia. This indicates a decline in the borrowers' capacity to repay credit, as seen by the rise in the value of banks non-performing loans (NPLs). In contrast, Fintech offers a transparent and user-friendly approach that makes predicting credit risk simple for its customers. Unlike banks, which continue to have insufficient credit practices.

This research is in line with research by Kristianti & Tulenan, (2021) which states that The NPL rate is a maximum of 5 percent, as indicated in the Bank's Maximum Lending Limit (LLL) report. Although the fintech system shows a decrease in its financial capacity, it will increase its financial capacity in the long run. In the long run, fintech's financial capability will increase.

Given that table 3's value for the paired sample t test findings indicates a significant value of 0.196, which is

lower than 0.05, it is possible to draw the conclusion that BOPO was the same before and after the Fintech phenomena, several banks that were sampled obtained a BOPO value above 97%, which can be categorized as unhealthy from 2018 to 2020 base on SE BI No.13/24/DPNP/2011. This indicates that traditional banking businesses listed on the Indonesia stock exchange were not significantly impacted by Fintech's entry into the country or its presence inside.

A lower ratio number indicates that the BOPO ratio is in good condition. Accordingly, a corporation is more efficient at making profits the lower its BOPO value. Banks are investing in Fintech services, which entails expenses for the banks throughout development. Banks are supposed to make money from fintech, yet the expense of development and upkeep still outweighs the revenue.

This research is not in line with Anisa, (2015), Santosa et al., (2017) that there is no significant difference in the BOPO ratio, both significant difference in the BOPO ratio both before and after the implementation of Fintech in Indonesia. As a result, there is a suspicion that the bank is unable to manage its security and automated processes, resulting in expenditure on maintenance, system development, staff training, and other operational costs. The implementation of fintech with considerable capital is also claimed to be unable to erase various bank activities in a short time. to erase in a short time.

CONCLUSION, IMPLICATION AND LIMITATION

The aforementioned explanation demonstrates how disruptive innovation Fintech is for the banking sector. The desire of individuals for financial ease and this issue are intimately connected. Fintech has the ability to boost financial penetration and assist banks in addressing problems like the unbanked population. Because Fintech start-ups and their customers are growing so quickly, banks are worried that Fintech might endanger their business. Consequently, there is a perception that the emergence of Fintech startups would make banks less powerful. Fintech is a thing now, but it cannot replace banks. From the results of the Paired T Test Sample which was used to see ROA and NPL in banking companies in 2013-2020, the application of fintech has had an influence on the performance and health of conventional banking in Indonesia which is the sample in this research, although seen from the

BOPO side it does not provide the same thing.

Despite their constant attempts to examine their business models and create new Fintech system offerings, banks' financial performance has not improved. As a result, management needs to be mindful about information technology spending. In actuality, banks benefit from the Fintech phenomena by working with Fintech firms. Through this relationship, both sides will benefit from sustaining a successful business and enhancing individual performance.

This study limitation is that assessment of financial performance before and after fintech appeared in Indonesia is only based on BOPO, NPL, and ROA ratios which are managed from secondary data sources of fintech reports managed from secondary data sources of financial statements of banking companies in 2013-2020.

One of the implications of this research is to support the use of fintech in improving the health and performance of banks in Indonesia. This shows that banks have implemented and felt the benefits of fintech itself. One of the objectives of banking is to improve financial performance, for example by increasing profitability, reducing operational costs, and overcoming bad debts.

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