Banking Financial Performance Before and After Financial Technology Era

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ABSTRACT: Technological development is a characteristic of the times. The role and benefits of technology have an impact on almost every aspect of life. This rapid technological advancement affects the activities of the people of Indonesia and Malaysia in several fields, one of which is the use of digital financial services or so-called financial technology. This research aims to compare and contrast the pre- and post-fintech financial performance of banking organizations in Malaysia and Indonesia in order to draw conclusions about the impact of fintech on these economies. A quantitative approach is taken in the research. Capital Adequacy Ratio (CAR), Non-Performing Loans (NPL), Operating Costs per Operating Income (BOPO), Return on Assets (ROA), and Loan to Deposit Ratio (LDR) are some of the metrics included in this analysis. The sample is grouped into conventional commercial banks listed on the Indonesian stock exchange and the Malaysian stock exchange. Wilcoxon signed-rank test and paired sample t-test are the methods utilized for analysis. The results showed that in the banking sector in Indonesia, there were differences based on CAR and NPL variables. While in the banking sector in Malaysia, there are differences based on CAR and BOPO variables.

KEYWORDS: Financial Technology, Financial performance, CAR, NPL, BOPO, ROA, LDR.

I. INTRODUCTION

In the current era of globalization, the development of information technology triggers a series of changes that change the nature of production to be unlimited. Therefore, every element of financial institutions is required to improve the quality of service to customers. One way to keep up with technological advances in improving the quality of customer service is the use of digital financial services or what is called financial technology.

Financial Technology (fintech) is a new field that attracts attention where in this era it has changed people's lifestyles in their daily activities. FinTech refers to an innovative form of financial technology and a fresh approach to business that has the potential to impact the delivery of financial services and the evolution of the financial sector. Additionally, it has the capacity to foster a competitive market culture and encourage service providers to build strong reputations.(Boot et al., 2021). The fast expansion of the financial technology sector has the potential to meet the diverse and lifestyle-specific needs of the people of Indonesia in a number of ways. (Santoso et al., 2020). Fintech represents a disruptive innovation that transforms business models to enhance efficiency and effectiveness, capable of disrupting established market participants. (Anagnostopoulos, 2018). According to Cressman, (2021), disruptive innovations caused by the presence of startup companies can disrupt the existence of incumbent companies. These disruptive innovations usually take on certain market segments that are less attractive to market incumbents, but these innovations are groundbreaking and have a direct impact on the current market. (Schmidt & Druehl, 2008). Disruptive innovation, may cause insolvency if not foreseen by the corporate sector. Everything from the industry's structure and technology for intermediation to the marketing model for consumers has been impacted by this disruption in the global financial service business (Hamdan et al., 2021).

The first fintech regulation issued in Indonesia in 2016 was included in Regulation (POJK) No. 77/POJK.01/2016 of the Financial Services Authority. (https://www.ojk.go.id). As for Malaysia, the first fintech regulation was through the Malaysian state bank which launched a sandbox regulator in 2016. (https://www.bnm.gov.my/sandbox). In Indonesia and Malaysia there is an association that serves as a forum for *fintech* organizers established in 2016 this association collaborates with various stakeholders who have the main objectives of accelerating innovation in the financial sector, connecting entrepreneurs and start-ups, and advancing national policies, laws and regulations in the *fintech* sector. *fintech* will shape the future of banking which will include business models with changes in the way people pay, send money, borrow and invest. (Kokh et al., 2020)*Fintech* can also help banks to reduce physical costs, improve performance, wider coverage, customer convenience, and revenue growth. Indonesia and Malaysia are the ASEAN countries that have more financial technology companies than other ASEAN countries with 17% in Indonesia and 11% in Malaysia, respectively. (Diniyya et al., 2021)..

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All financial institutions in Indonesia and Malaysia continue to adapt to develop their innovations in this financial technology era, Banking is one of the country's most vital financial organizations. In the world of finance, banks are indispensable as middlemen, connecting those with surplus funds to those in need of funds (deficit units), and enabling the smooth flow of payment traffic (Al-Ajlouni & Al-Hakim, 2019). Banks need to continue to develop many new innovations in line with the goal that banks can support innovation in the provision of digital services. As banks develop their fintech, they play an important role in increasing financial inclusion, which means more people can access financial services that may have previously been difficult to reach in certain areas (Karsh & Abufara, 2019). (Karsh & Abufara, 2020).. With the existence of *fintech* services in banking, it also increases the level of the number of bank transactions which is reflected in the bank's financial performance (Baker et al., 2023). (Baker et al., 2023).

Financial performance analysis is used to assess whether a company has effectively and efficiently utilized its funds. Given that banks play a significant role in economic activities, it is crucial for them so they can continue to make money and help a country's economy grow economy (Muhadzdzib & Leon, 2022). The term "financial performance" refers to how well a bank handles its money during a given time period, including how it raises capital and how it spends it. The financial performance of the organization is the main focus of investors since it shows the company's level of profit generation and the prospects for the company's continued operation (Majidah & Aryanty, 2023). A country's economic progress is influenced, in part, by the financial performance of its banks. If the financial sector experiences positive growth, it will also make a positive contribution to economic growth (Tshukudu et al., 2022). Romanova & Kudinska, (2016) explained that innovations that occur in banking through the *fintech* phenomenon are not a disruption but as an opportunity to develop fintech services and improve banking financial performance.

Several previous research has been carried out to evaluate the monetary efficiency of financial institutions before and after the existence of *fintech*, including research conducted by Suryanto et al., (2022) which measures contrasting the financial results achieved prior to and subsequent to the existence of fintech using the *Capital Adequacy Ratio* (CAR), Operating Expenses to Operating Income (BOPO), *Loan to Deposit Ratio (*LDR), *Net Interest Margin* (NIM), *Return on Asset (*ROA) and *Non Performing Loan* (NPL) states that with the existence of *fintech* there is a difference in value in the financial performance of banks. Furthermore, research conducted Salsabila Bela et al (2022), which uses ROA states that there are differences in bank profitability after fintech. Furthermore, research by Oktari Y & Yanti D, (2022) using the CAR, NPL, BOPO, ROA ratios showed a significant difference in banking performance before and after the existence of fintech. Research conducted Idfilandu (2021), Kaddumi et al. (2023) using Loan to Asset Ratio (LAR), Loan to Deposit Ratio (LDR), Debt to Asset Ratio (DAR), Debt to Equity Ratio (DER), ROA, ROE, and Return on Invested Capital (ROIC) show that these ratios have a significant negative effect on financial performance when implementing fintech. Meanwhile, research conducted by Bela & Amanah (2022) stated that ROA, ROE, and NIM have no effect on financial performance when implementing fintech. Furthermore, research conducted Anindya & Kartini, (2023) reveals that following financial technology rules, the ROA, ROE, and CAR variables witness an increase in value, whereas the BOPO and LDR variables experience a decrease in value. Research conducted Rickinghall, (2022) shows the ratio of ROA, ROE, and the level of pdb has increased after the existence of fintech on bank performance in Malaysia. Furthermore, research conducted by Almashhadani, (2023) showed a difference in ROA and ROE values at banks in the UAE after adopting fintech. Other studies also say the presence of fintech increases total deposits and profits in financial institutions that are traded on the stock markets in Amman and Abu Dhabi (Baker et al., 2023).

After ratifying legislation pertaining to the fintech industry, this study compared the financial performance of banks in Indonesia and Malaysia. This research is expected to provide additional knowledge for the development of science, especially related to *Financial Technology* to the financial industry that has entered the era of digitalization and also has a positive impact on financial inclusion.

Financial Technology

The term "Fintech" describes the creative use of technology by non-bank financial organizations to offer financial services. The National Digital Research Center (NDRC) states that Fintech utilizes information technology as a tool for reaching consumers. Fintech is a business update engaged in finance by utilizing technological developments to facilitate the public in terms of system transactions regarding finance to make it easier and more practical. (Wang et al., 2021). Financial technology, or fintech, is the application of new technology to the development and distribution of financial services and goods, which aims to compete with traditional financial methods and facilitate financial activities. (Ireri & Kimutai, 2020). Financial technology ultimately changes the business model from traditional to modern.

Fintech is defined as the use of technology platforms and mobile devices to access transaction information, bank accounts, and credit cards, and provide debit reminders through instant messaging services, apps, or other methods of information as needed (Elia et al., 2023). Fintech provides simple, safe and convenient financial services that can help the community and improve the economy. expanding the scope of financial services that have similarities with the financial industry in terms of roles, but the difference is that fintech prioritizes the use of technology in every transaction. (Yudaruddin, 2023), (Su & Liu, 2017). Current forms of financial technology (fintech) include crowdfunding, microfinancing, peer-to-peer lending services, digital payment systems, and market comparison, according to the Financial Services Authority (OJK).

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Financial Performance

Financial performance is used to determine certain indicators that can measure the success of an organization or bank in generating profits. (Meziane & Bouguetaia, 2023). According to the Indonesian Institute of Accountants (2007) banking financial performance is the ability of a bank to manage and control its resources, and profitability is a related indicator of banking financial performance. Financial performance is the Company's effort in managing resources, and its success can be measured by the growth of profits it generates, so that it can predict the Company's condition in the next period. (Jarah et al., 2024).

The level of success of a bank's financial performance can be known through measurement and assessment of bank performance. Performance measurement is one of the most important factors for banks, because these measurements can influence decision-making behavior in banking. (Litimi et al., 2024). Measurement of bank financial performance can use various methods. Generally, the method used to see the financial performance of banks using the assessment of the level of banking health. Yang & Masron, (2023) mentions the objectives of financial performance, which include: 1) Figuring out how well the bank has managed its finances, looking at things like current and past profitability, capital adequacy, and liquidity. 2) Assessing the efficiency with which the bank can turn its total asset portfolio into profit.

Camel Ratio

Camel is used to measure the level of performance and health of banks, the camel ratio consists of *capital, asset quality, management, earnings, liquidity* (Munir & Bustamam (2017) explains the meaning of CAMEL, which are:

a. *Capital Adequacy* is a way for banks to manage their risk that is based on the value of their assets.
b. *Asset Quality* is the risk to banks' solvency that comes from high levels of non-performing loans, which disrupt their assets.
c. *Managerial Quality* indicates how well a bank handles stress in its operations.
d. *Earning* determines the bank's capacity to generate profits from its assets and capital, which in turn helps the bank grow its company.
e. *Liquidity* is the bank's ability to pay its short-term liabilities.

The Camel ratio is designed to help evaluate financial statements or help us identify some of the Bank's financial strengths and weaknesses. This ratio is also a tool for comparing the Company's position with competitors, for the Company's future financial policies. (Afroj, 2022). The proxies used in this study are CAR representing the capital aspect, NPL representing the asset aspect, BOPO representing the management aspect, ROA representing the earning aspect, and LDR representing the liquidity aspect.

II. RESEARCH METHOD

This study uses a quantitative research approach method. quantitative research is a method that focuses on describing but can also predict a study. (Cooper & Schindler., 2014). This research is also descriptive and comparative. Research with the goal of documenting the current condition of an existing ailment is known as descriptive research. This type of study just records the symptom in its current form. (Saunders et al., 2014). (Saunders et al., 2009).. People that participated in this research were 39 mainstream commercial banks traded on the IDX listing and 27 of Malaysia's conventional commercial banks are publicly traded. Sampling using *purposive sampling,* which is a technique that takes samples based on certain criteria. The criteria used are: 1) Listed on every stock exchange are conventional commercial banks. 2) Indonesian and Malaysian conventional commercial banks that have issued yearly reports continuously between 2013 and 2019. Then the total sample in this study was 47 companies. The variables used in this study include financial ratios CAR, NPL, BOPO, ROA, LDR. This study uses SPSS software and uses paired sample t-test and Wilcoxon test.
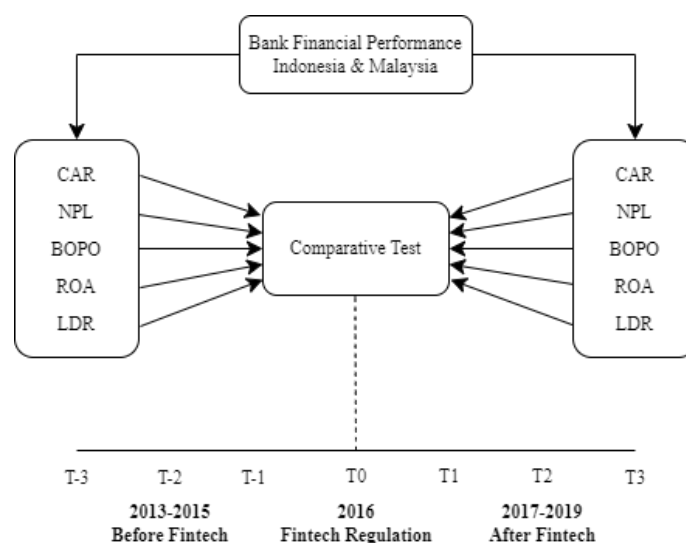

Figure 1 Framework of Thought).

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III. RESEARCH RESULT

Descriptive Statistics

Table 1 shows the results for Indonesia, while Table 2 shows the results for Malaysia. The descriptive statistics were utilized to find the minimum and maximum values as well as the mean and standard deviation. Financial Performance in the Indonesian Banking Sector: A Descriptive Statistical Analysis (Table 1).

Table 1. Descriptive Statistical Analysis of Financial Performance in the Banking Sector in Indonesia

Descriptive Statistics				
	Minimum	Maximum	Mean	Std. Deviation
CAR before	8.02	28.26	17.50	3.70
NPL before	0.34	18.60	2.98	2.95
BOPO before	5.27	173.80	84.71	23.71
ROA before	-7.58	18.60	1.90	3.54
LDR before	14.93	109.08	83.18	16.87
CAR after	9.01	39.23	20.83	5.36
NPL after	0.79	23.31	3.90	3.80
BOPO after	58.20	258.09	91.56	26.70
ROA after	-15.89	23.31	1.68	4.66
LDR after	20.96	163.10	83.88	18.94

Source: Data processed by the author

Table 2. Descriptive Statistical Analysis of Financial Performance in the Banking Sector in Malaysia

Descriptive Statistics				
	Minimum	Maximum	Mean	Std. Deviation
CAR before	7.41	35.46	16.12	4.15
NPL before	0	4.53	1.34	1.00
BOPO before	4.99	172.66	49.22	31.94
ROA before	0.03	3.22	0.98	0.56
LDR before	35.63	97.15	82.04	12.75
CAR after	14.2	39.12	19.10	5.27
NPL after	0	3.9	1.42	1.13
BOPO after	2.7	58.13	35.52	14.30
ROA after	0.06	2.95	1.12	0.61
LDR after	32.2	98.06	84.37	12.17

Source: Data processed by the author

Normality Test

One way to check if your data follows a normal distribution is via a normalcy test. The Kolmogorov Smirnov test, with a significance threshold of 5% or 0.05, is used to test for data normality. If the Asym. Sig value is greater than 5% (sig>0.05) in this test, it may be concluded that the data follows a normal distribution. On the other hand, we can say that the data does not follow a normal distribution if the value is less than 0.05.

Table 3. Normality Test

Normality Test	Asymp. Sig. (2-tailed)	
	Indonesia	Malaysia
CAR	0.00	0.00
NPL	0.00	0.90
BOPO	0.59	0.01

| ROA | 0.40 | 0.32 |
| LDR | 0.49 | 0.21 |

Source: Data processed by the author

Table 3 proves that all financial performance ratio data, whether collected before or after fintech was used, is highly valuable. Data for BOPO, ROA, and LDR ratios in Indonesia appear to follow a normal distribution, according to the results, as the significance value is greater than 0.05. Following this, the paired sample t-test will be used for additional analysis. However, at a significance level below 0.05, the data for the CAR and NPL ratios does not follow a normal distribution. Consequently, additional analysis will be conducted using the Wilcoxon test.

The significant values in Malaysia are in the NPL, ROA, LDR ratios because the sig value is above 0.05 so the data is normally distributed and can be continued with the paired sample t-test. Data that is not normally distributed is in the CAR and BOPO ratios because the significant value is below 0.05 which can be continued in the Wilcoxon test.

Paired Sample t-test

Paired Sample t-Test or paired t-test is a calculation of two data from the same subject to analyze whether there is a difference in the same group before and after testing by comparing the two average values with normally distributed samples. A significance value <0.05 then proves there is a significant difference in each variable and a significance value >0.05 then proves there is no significant difference in each variable.

Table 4. Paired sample t-test in Indonesia

Paired Samples Test						
	Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)
BOPO before - BOPO after	-7.48	37.97	4.07	-1.83	86	0.07
ROA before - ROA afer	0.09	6.42	0.68	0.14	86	0.88
LDR before - LDR after	0.32	24.67	2.64	0.12	86	0.90

Source: Data processed by the author

Table 4 shows that the ratio of BOPO, ROA, LDR has a sig value. (2-tailed) more than 0.05 which means there is no difference before and after implementing fintech in Indonesia.

Table 5. Paired sample t-test in Malaysia

Paired Samples Test						
	Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)
NPL before- NPL after	-0.36	1.44	0.19	-1.86	53	0.06
ROA before - ROA afte	-0.15	0.92	0.12	-1.22	53	0.22
LDR before - LDR after	-0.74	17.79	2.42	-0.30	53	0.75

Source: Data processed by the author

Table 5 shows that the ratio of NPL, ROA, LDR has a sig. (2-tailed) more than 0.05 which means there is no difference before and after implementing fintech in Malaysia.

Wilcoxon Test

The Wilcoxon test is a nonparametric test that is useful for observing whether there is a significant difference between two related samples. If the value of Asymp. Sig. (2-tailed) < 0.05 then it indicates a significant difference. If Asymp. Sig. (2-tailed) value > 0.05 then it shows no significant difference.

Table 6. Wilcoxon test on CAR and NPL ratios in Indonesia

Wilcoxon Test	Z	Asymp. Sig. (2-tailed)
CAR before-after	-4.58[b]	0.00
NPL before-after	-2.25[b]	0.02

Source: Data processed by the author

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Table 6 shows the value of Asymp. Sig. (2-tailed) on the CAR and NPL ratios before and after implementing fintech below 0.05, which means that there are differences in the CAR and NPL ratios before and after implementing fintech in Indonesia.

Table 7. Wilcoxon test on CAR and BOPO ratios in Malaysia

Wilcoxon Test	Z	Asymp. Sig. (2-tailed)
CAR before-after	-4.58[b]	0.00
BOPO before - BOPO after	-2.38[b]	0.01

Source: Data processed by the author

Table 7 shows the value of Asymp. Sig. (2-tailed) on the CAR and BOPO ratios before and after implementing fintech below 0.05, which means that there are differences in the CAR and BOPO ratios before and after implementing fintech in Malaysia.

DISCUSSION
DIFFERENCES IN BANKING FINANCIAL PERFORMANCE BEFORE AND AFTER IMPLEMENTING FINANCIAL TECHNOLOGY AS MEASURED BY CAR

The CAR ratio is considered important for risk control including credit, market and operational risks. The greater the CAR value, the better a bank's capital sufficiency. The test results state that there are differences in banking financial performance in Indonesia before and after implementing *fintech as* measured by CAR. As well as, there are variations in the financial success of banks in Malaysia before and after implementing *fintech* measured by CAR. This means that the financial performance of banks in Indonesia and Malaysia experienced differences based on the CAR ratio after implementing financial *technology. The* results of this study are in line with research (Fatmawati & Lestari, 2024) which states that CAR has an influence on bank performance before and after fintech. In contrast to the research results Almurni et al., (2023) which states that CAR has no influence on bank financial outcomes prior to and following the invention of fintech.

DIFFERENCES IN BANKING FINANCIAL PERFORMANCE BEFORE AND AFTER IMPLEMENTING FINANCIAL TECHNOLOGY AS MEASURED BY NPLS

NPL is a ratio to assess banking credit risk, in other words, it measures the bank's ability to overcome non-performing loans. The lower the NPL value, the better the banking performance because there are not many non-performing loans. Banks in Indonesia had different financial performances before and after applying the system, according to the test results *fintech as* measured by NPL. Also, in terms of financial performance, there is little variation among banks in Malaysia before and after implementing *fintech as* measured by NPL. This means that the financial performance of banks in Indonesia experienced differences based on NPLs after implementing financial *technology,* but this did not happen to banks in Malaysia. Because with the existence of *financial technology, it* does not differentiate financial performance based on NPLs. The results of the author's research on banking in Indonesia are in line with research conducted by Katsiampa et al., (2022) which states that there is a significant difference between NPLs in banks before and after the existence of fintech. Research Ozili, (2022) also supports these results by showing the difference in NPL values in bank performance before and after the fintech phenomenon.

DIFFERENCES IN BANKING FINANCIAL PERFORMANCE BEFORE AND AFTER IMPLEMENTING FINANCIAL TECHNOLOGY AS MEASURED BY BOPO

A bank's operational expense ratio is a measure of how well it runs its day-to-day operations. To evaluate the efficacy of the bank's management in managing operational expenses in relation to operational income, one might look at the BOPO ratio, which stands for operating expense income. Banks in Indonesia did not see a change in their BOPO-measured financial performance either before or after adopting *fintech*, according to the test results. However, Malaysian banks' bottom lines looked different before and after the introduction of *fintech as* measured by BOPO. This means that the financial performance of banks in Malaysia experienced differences based on BOPO after implementing financial *technology,* but nothing similar happened to banks in Indonesia. Because with the existence of *financial technology, it* does not differentiate financial performance based on BOPO.

Consistent with previous studies on Malaysian banking, the author's findings are presented in Wijaya (2020) showing that Fintech with indicators of phone banking, sms banking, mobile banking, internet banking has an effect on financial performance as measured using the BOPO ratio.Litimi et al., (2024) also supports these results by showing that A notable distinction exists in the BOPO ratio in the span of 8 quarters before and after collaborating with Islamic Fintech companies.

DIFFERENCES IN BANKING FINANCIAL PERFORMANCE BEFORE AND AFTER IMPLEMENTING FINANCIAL TECHNOLOGY AS MEASURED BY ROA

Return on Assets is employed to evaluate the efficacy of bank management to earn profit (profit) as a whole. The higher the rate of return on assets of a bank, the greater the profit earned by the bank, and the better its position in the use of assets. The test

results state that there is no difference in the financial performance of banks in Indonesia and Malaysia before and after implementing *fintech as* measured by ROA. This means that the financial performance of banks in Indonesia and Malaysia does not differ based on ROA after implementing financial *technology.*

The results of the authors' research are not in line with research (Zhao et al., 2022) which shows that there is a change in ROA value when implementing Fintech because fintech reduces bank profitability.

DIFFERENCES IN BANKING FINANCIAL PERFORMANCE BEFORE AND AFTER IMPLEMENTING FINANCIAL TECHNOLOGY AS MEASURED BY LDR

Loan to Deposit Ratio (LDR) calculates the proportion of total funding coming from public and private sources as a percentage of total credit extended. A decrease in LDR can occur due to a decreasing number of loans or an increasing banking company deposit. An increase in the number of loan services leads to a decrease in LDR, influenced by the rise in deposits and third-party funds. Test results show the fact that banks' bottom lines are identical in Indonesia and Malaysia before and after the implementation of fintech, as measured by LDR. This indicates that the profitability of Indonesian banking institutions and Malaysia does not differ based on LDR after utilizing technological solutions in the banking sector.

The results of the authors' research are not in line with research (Ogbuji et al., 2020) which the LDR ratio affects banking performance due to differences in value before and after the existence of fintech.

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CONCLUSIONS

Comparative testing of bank comparison between pre- and post-fintech financial success in and Malaysia is carried out based on the measurement of financial performance ratios, namely CAR, NPL, BOPO, ROA, LDR. The test results show that, in the banking sector in Indonesia, there are differences in bank performance before and after the existence of fintech based on CAR and NPL variables. While in the banking sector in Malaysia, using CAR and BOPO variables, we can see that bank performance changed both before and after fintech came into being.

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