AKRUAL: Jurnal Akuntansi *Vol 16, issue 1, October 2024*
p-ISSN: 2085-9643 DOI: 10.26740/jaj.v16n1.p15-p24
e-ISSN: 2502-6380 https://journal.unesa.ac.id/index.php/aj

Financial Technology Investment: A Comparative Analysis of Profitability and Performance in Indonesian State-Owned and Sharia Banks

Anny Widiasmara [1*], Wulan Retnowati [2], Joel I. Alvarez [3], and Eduardo K. De Guzman[4]

[1] Accounting Departement, Faculty of Economics and Business, Universitas PGRI Madiun, Jalan Setia budi 85 Madiun, Indonesia
[2] Accounting Departement, Faculty of Economics, Universitas Sultan Ageng Tirtayasa Jl. Raya Palka Km 3 Sindangsari, Pabuaran, Kab. Serang Provinsi Banten,Indonesia
[3,4] College of Education, Nueva Ecija University of Science and Technology, Philippines

e-mail: [1*] annywidiasmara@unipma.ac.id
* Corresponding Author

Abstract

Introduction/Main Objectives: *This study strives to provide empirical evidence of differences in Return on Asset (ROA), Return on Equity (ROE), Operational Expense to Operational Revenue (BOPO), Net Interest Margin (NIM), Operational Expense Ratio (OPER), and Revenue per Employee (RPE) before and after investing in financial technology within Indonesian Sharia and State-Owned Banks.* ***Background Problem:*** *In the digital age, the need for more understanding regarding strategic investments in financial technology within the banking sector emerges as an expensive predicament. This presents a global debate over cost-effectiveness, competitive pressures, intricate bank operations, workforce management, and employee adaptability.* ***Research Methods:*** *This research employs a quantitative approach with a comparative study design, comparing key financial metrics before and after fintech collaboration for both State-Owned Banks. The study utilizes secondary data. In the analysis process, the data normality test takes precedence. If the data are normally distributed, the paired sample t-test is employed. The analysis is facilitated through the use of SPSS 32 software.* ***Finding/ Result:*** *The results of this research show that, for the most part, there is no significant difference in the profitability ratios of ROA, ROE, NIM and BOPO, OPER, and RPE in Islamic banks. However, there is a tendency for performance to increase for ROA, ROE, NIM and BOPO, OPER, and RPE after collaborating with startup fintech. In contrast, State-Owned Banks exhibit differences in ROA and BOPO variables before and after such collaborations.* ***Conclusion:*** *The performance metrics of ROA, ROE, and NIM in State-Owned Banks have deteriorated post-collaboration with fintech entities. This calls for caution from the banking sector as it could incur financial losses, negatively impacting operations and overall performance.*

Keywords: ***BOPO; NIM; OPER; ROA; RPE***
JEL Classification: M41; G21

Article History: Received: April, 29th 2023 Revised: January, 7th 2024 Accepted: May, 3rd 2024 Published: October, 5th 2024
How to cite: Widiasmara et al. (2024). Financial Technology Investment: A Comparative Analysis of Profitability and Performance in Indonesian State-Owned and Sharia Banks. *AKRUAL: Jurnal Akuntansi*, *16*(1). DOI: 10.26740/jaj.v16n1.p15-p24
Conflict of Interest Statement: There is no conflict of interest in the articles resulting from this research

INTRODUCTION

In the digital age, navigating shrewd investments in financial technology for the banking sector becomes a significant challenge. This challenge, characterized by cost-effectiveness, competitive tension, intricate banking operations, human resource management, and employee adaptability, has become a topic of global discourse (KPMG, 2012; Beccalli, 2014; Chhabra, Vishwanathan,2018; Khajehdangolani,2011; Al-azzawi&Altmimi, 2015; Solikhin, 2021). Observations suggest that ill-considered investments in financial technology can potentially lead to financial losses, adversely impacting banking institutions' operations and overall performance (Roy et al., 2018).

The rivalry between the banking industry and fintech companies is escalating in Indonesia. Today, virtually all banking services can be accessed via fintech startups, which are noted for their user-friendly procedures. Numerous state-owned banks (BUMN) and Sharia banks have ventured into this business to capture the market share seized by various fintech companies. Rini Soemarno, the Minister of State-Owned Enterprises, has encouraged banks that are part of the consortium of state-owned banks (Himbara), namely PT Bank Mandiri (Persero) Tbk (BMRI), PT Bank Rakyat Indonesia (Persero) Tbk (BBRI), and PT Bank Negara Indonesia (Persero) Tbk (BBNI) to penetrate the fintech sector. The specific fintech, named LinkAja, is a digital wallet that amalgamates the electronic money of Bank Mandiri (e-cash), Bank BNI (Unikqu), Bank BRI (Tbank), and Telkom Group (TCASH and T-money). This platform was officially unveiled in early March 2019 (Yanurisa Ananta, 2019).

Bank Syariah Indonesia is the product of a merger between three state-owned Sharia banks: BNI Syariah, BRI Syariah, and Bank Syariah Mandiri. As a newly formed entity, its detailed fintech data and profitability metrics are currently not available. However, the Indonesian Joint Funding Fintech Association (AFPI) suggests that Bank Syariah Indonesia's presence will bolster the infrastructure of Sharia fintech.

This study carries significance as it examines the aim of banking collaborations with fintech, primarily to boost competitiveness, profitability, and overall banking performance. Metrics such as Return on Asset (ROA), Return on Equity (ROE), and Operational Expense to Operational Revenue (BOPO) are used to gauge profitability and performance. These metrics span three domains: driving sales growth, reducing operational costs, and enhancing employee efficiency, either through cost reduction or revenue maximization. These are measured by the Net Interest Margin (NIM), Operational Expense Ratio (OPER), and Revenue per Employee (RPE). Leckey-Leckson et al. (2011) suggest that technology planning can induce risk and anxiety among management, employees, and regulators in an unstable economic environment. This is due to the significant investment required for technology-supported products, which creates ambiguity, especially in developing countries

p-ISSN: 2085-9643 DOI: 10.26740/jaj.v16n1.p15-p24
e-ISSN: 2502-6380 https://journal.unesa.ac.id/index.php/aj

where astute technology planning can be a challenge (Sharma, 2012). Global banking system research encompasses various profitability measures. Empirical studies have produced inconsistent results on the hypothesis that financial technology investment enhances bank profitability (Central, 2016; Iman, 2020; Shu & Strassmann, 2005; Yoo, 2017). A study (Roy & Thangaraj, 2019) revealed that private-sector banks are more aggressive in their financial technology investments in India than their public-sector counterparts.

This study introduces a novel approach based on the phenomena above and identified research gaps. In collaboration with fintech startups, the researchers aim to analyze the impact of financial technology investments made by Indonesian banks, specifically Sharia Banks and State-Owned Banks. The focus is on their profitability and performance across three domains: driving sales growth, reducing operational costs, and enhancing employee efficiency, either through cost reduction or revenue maximization. Existing Indonesian research has primarily concentrated on the influence of financial technology on profitability, comparing metrics before and after partnerships with fintech startups (Solikhin, 2021; Ratnawati, 2020). However, this study must focus on profitability and performance across the three domains following collaborations with fintech startups. The impetus behind this approach is the recognition that hasty or ill-considered investments in financial technology can potentially lead to financial losses, adversely affecting both the operations and overall performance of banking institutions.

METHOD

This research employs a quantitative approach with a comparative study design, comparing key financial metrics before and after fintech collaboration for both State-Owned Banks (Bank BNI, BTN, BRI, Mandiri) and Sharia Banks (Bank BRI Syariah, BNI Syariah, Mandiri Syariah, and BSI). These metrics include Return on Asset (ROA), Return on Equity (ROE), Operational Expense to Operational Revenue (BOPO), Net Interest Margin (NIM), Operation Expense Ratio (OPER), and Revenue per Employee (RPE) for the years 2018-2019 and 2020-2021. The study utilizes secondary data, specifically financial and annual reports for 2018-2021, which can be accessed at www.idx.co.id. In the analysis process, the data normality test takes precedence. If the data are normally distributed, the paired sample t-test is employed. Conversely, the nonparametric Wilcoxon test is applied if the data are not normally distributed. The analysis is facilitated through the use of SPSS 32 software.

RESULTS AND DISCUSSION

The analysis of the profitability ratio, OPER, and RPE involved assessing these metrics before and after fintech collaborations in Sharia and State-Owned Banks. The variables of ROA, ROE, BOPO, NIM, OPER, and RPE in Sharia banking were found to be normally distributed. Hence, a parametric test, specifically the Paired sample t-test, was employed. Similarly, ROA, ROE, BOPO, NIM, and OPER variables in State-Owned Banks were typically distributed and tested using the Paired sample t-test. However, the RPE variable was not normally distributed, necessitating a nonparametric Wilcoxon test.

Table 1. Normality Test in Sharia Banks

	ROA	ROE	BOPO	NIM	OPER	RPE
Kolmogorov-Smirnov Z	0.633	0.569	0.647	0.574	0.884	1.041
Asymp. Sig. (2-tailed)	0.817	0.902	0.797	0.897	0.416	0.229

Source: data processed by authors

Table 2. **Normality Test in State-Owned Banks**

	ROA	ROE	BOPO	NIM	OPER	RPE
Kolmogorov-Smirnov Z	.530	.696	.658	.794	1.168	2.066
Asymp. Sig. (2-tailed)	.941	.718	.779	.554	.131	.060

Source: data processed by authors

Table 3. Descriptive Data Before and After Collaborating with Fintech Startups in Sharia Banks

	Mean	Std.Devation
ROA_Before Fintech	0.9950	0.74155
ROA_After Fintech	13.500	0.38713
ROE_Before Fintech	70.325	591.758
ROE_After Fintech	109.350	448.218
BOPO_Before Fintech	896.875	757.136
BOPO_After Fintech	843.350	469.122
NIM_Before Fintech	226.300	193.330
NIM_After Fintech	240.088	128.911
OPER_Before Fintech	8,0413	5,3488
OPER_After Fintech	2,0761	2,3663
RPE_Before Fintech	402140031	354572291
RPE_After Fintech	506055556	548917720.

Source: data processed by authors

p-ISSN: 2085-9643 DOI: 10.26740/jaj.v16n1.p15-p24
e-ISSN: 2502-6380 https://journal.unesa.ac.id/index.php/aj

Table 4. Descriptive Data Before and After Collaborating With Fintech Startups in State-Owned Banks

	Sig. (2-tailed)
ROA_Before Fintech ROA_After Fintech	0,019*
ROE_Before Fintech ROE_After Fintech	0,265
BOPO_Before Fintech BOPO_After Fintech	0,068**
NIM_Before Fintech NIM_After Fintech	0,662
OPER_Before Fintech OPER_After Fintech	0,271
RPE_Before Fintech RPE_After Fintech	0,779

Source: data processed by authors
*Significance 5%
** Significance 10%

The descriptive data reveals that the mean ROA for Sharia banks increased from 0.9950 before fintech to 1.3500 after fintech. However, the significance level of 0.257 (>0.05) indicates that the difference in ROA before and after fintech in Sharia banks is not statistically significant. In contrast, the mean ROA decreased for state-owned banks from 2.5063 before fintech to 1.5338 after fintech. The significance level of 0.019 (<0.05) suggests a statistically significant difference in these banks' ROA before and after fintech.

The analysis of the Return on Assets (ROA) ratio for Sharia banks reveals an upward trajectory from 0.9950 to 1.3500. This suggests that Sharia banks have seen an increase in net income following their collaborations with fintech startups, even though their ROA metrics were already deemed quite robust. However, the statistical analysis shows no significant difference in the ROA before and after the fintech collaboration in Sharia banks, as indicated by a significance value of 0.257, exceeding the threshold of 0.05. Conversely, the ROA ratio analysis for State-Owned Banks shows a downward shift in the ROA variable from 2.5063 to 1.5338, implying a decrease in net income after they engage with fintech startups. The hypothesis proposing a significant difference in the ROA before and after fintech investments in Sharia Banks is accepted, supported by the significant value of 0.019, less than 0.05.

The mean ROE for Sharia banks increased from 7.0325 before fintech to 10.9350 after fintech. However, the significance level of 0.111 (>0.05) indicates that the difference in ROE

before and after fintech in Sharia banks is not statistically significant. For state-owned banks, the mean ROE decreased from 14.65 before fintech to 11.31 after fintech. However, the significance level of 0.265 (>0.05) suggests that the difference in ROE before and after fintech in these banks is not statistically significant. Our ROE analysis for Sharia banks reveals an increase in the ROE metric from 7.0325 to 10.9350, suggesting that these banks have been successful in leveraging their capital to augment net income and satisfy investors' interests after collaborating with fintech startups. This performance indicates a robust ROE for these banks. Conversely, the ROE for state-owned banks decreases from 14.65 to 11.31. This suggests that these banks must be more successful in maximizing their capital to generate net income and meet investor interests after partnering with fintech startups. However, our research indicates no significant difference in ROE before and after fintech collaboration between Sharia and state-owned banks. This is corroborated by the significance values being more significant than 0.05 (0.111 for Sharia banks and 0.265 for state-owned banks).

The mean NIM for Sharia banks increased from 22.6300 before fintech to 24.0088 after fintech. However, with a significance level of 0.114 (>0.05), there is no statistically significant difference in NIM before and after fintech in Sharia banks. For state-owned banks, the mean NIM increased slightly from 0.0375 before fintech to 0.0421 after fintech. However, the significance level of 0.662 (>0.05) indicates that the difference in NIM before and after fintech in these banks is not statistically significant. The NIM analysis for Sharia banks shows a rise from 22.6300 to 24.0088, indicating that these banks have successfully generated substantial interest income after partnering with fintech startups. Similarly, state-owned banks have experienced an increase in NIM from 0.0375 to 0.0421, suggesting an improvement in generating interest income after fintech collaborations. However, the research highlights no significant difference in NIM before and after fintech partnerships in both types of banks, as evidenced by the significance values exceeding 0.05 (0.114 for Sharia banks and 0.662 for state-owned banks).

The descriptive data reveal that the mean BOPO for Sharia banks decreased from 89.6875 before fintech to 84.3350 after fintech. However, the significance level of 0.129 (>0.05) indicates that the difference is not statistically significant. In contrast, the mean BOPO increased for state-owned banks from 74.9500 before fintech to 82.2750 after fintech. The significance level of 0.068 (<0.10) suggests a statistically significant difference in these banks' BOPO before and after fintech. The BOPO analysis for Sharia banks indicates a decrease in the BOPO metric from 89.6875 to 84.8435, suggesting a decline in efficiency and operational capabilities after collaborations with fintech startups despite the BOPO criteria being classified as robust. Conversely, the BOPO analysis for state-owned banks shows an increase in the BOPO measure from 74.9500 to 82.2750, pointing to an improvement in efficiency and operational capabilities post-fintech partnerships. However, our research reveals no significant difference in the BOPO metric pre and post-fintech

p-ISSN: 2085-9643 DOI: 10.26740/jaj.v16n1.p15-p24
e-ISSN: 2502-6380 https://journal.unesa.ac.id/index.php/aj

collaborations, evidenced by a significance value of 0.129 (>0.05) in Sharia banks and a significant difference of less than 10% (0.068 < 0.10) in state-owned banks.

The mean OPER for Sharia banks rose dramatically from 80,410,372,750,000 before fintech to 207,603,582,250,000 after fintech. However, with a significance level of 0.393 (>0.05), there is no statistically significant difference in OPER before and after fintech in Sharia banks. The mean OPER decreased for state-owned banks from 11,162,176,875,000 before fintech to 1,422,996,250,000 after fintech. However, the significance level of 0.271 (>0.05) suggests that the difference is insignificant. The OPER analysis for Sharia banks reveals an increase in the OPER metric from 80,410,372,750,000 to 207,603,582,250,000, indicating that operational costs have increased post-fintech collaborations. This could be attributed to these banks' merger into Bank Syariah Indonesia (BSI).

On the other hand, the OPER analysis for state-owned banks shows a decrease in the OPER measure from 11,162,176,875,000 to 1,422,996,250,000, suggesting a reduction in operational costs after fintech collaborations, leading to increased efficiency. Our research on the impact of fintech on OPER shows no significant difference in OPER pre- and post-fintech collaborations, as reflected by a significance value of 0.393 (>0.05) in both Sharia and state-owned banks.

The mean RPE for Sharia banks increased from 402,140,031.30 before fintech to 506,055,556.35 after fintech. However, the significance level of 0.768 (>0.05) indicates that the difference in RPE before and after fintech in Sharia banks is not statistically significant. For state-owned banks, the mean RPE decreased from 275,771,566.58 before fintech to 164,097,672,703.85 after fintech. However, the significance level of 0.779 (>0.05) indicates that the difference is not statistically significant. The RPE analysis for Sharia banks reveals an increase in the RPE metric from 402,140,031.30 prior to fintech partnerships to 506,055,556.35 post partnerships. This suggests that employee-related costs, encompassing salary, benefits, training, bonuses, workforce adjustments, and growth in the customer base, have increased following technology investments. This rise aligns with expectations of enhanced profitability, as expanding the customer base often necessitates a larger workforce in Sharia banks. Conversely, the RPE analysis for state-owned banks shows a decrease in the RPE measure from 275,771,566.58 to 164,097,672,703.85, indicating a reduction in employee-related costs post technology investments. Our research on the impact of fintech on RPE indicates no significant difference in RPE pre and post-fintech collaborations, as reflected by the significance value of 0.768 (>0.05) for Sharia banks and 0.779 (>0.05) for state-owned banks.

CONCLUSION

In conclusion, the ROA of Sharia banks is on an upward trend compared to that of State-Owned Banks. This aligns with the findings of (Moridu, 2020), who argues that the rise in digital banking transactions, such as SMS banking, mobile banking, and internet banking, does not necessarily lead to a 15% profit increase. It also concurs with the research of (Mayasari, 2021), which suggests that Internet banking has a negligible and negative impact on the performance of Indonesian banks, as seen from the 2010-2019 financial reports.

However, it contradicts the research by (Magaya, 2020), who asserts that online banking transactions significantly and positively predict ROA, with an increase in online transactions leading to an uptick in ROA. Therefore, we recommend that bank management invest further in digital banking to enhance the financial performance of Sharia banks. The influence of fintech startups on ROE states that the ROE variable before and after collaborating with startups in Sharia banks and state-owned banks shows no significant difference. Research has stated that Internet banking services do not significantly affect banking financial performance as measured in ROE. This is also by research conducted by (Dita, 2019), which states that Internet banking does not significantly affect financial performance.

The influence of fintech on NIM states that the NIM variable before and after collaborating with fintech startups at Sharia banks and state-owned banks shows little difference. This is consistent with the study by(Indrianti et al., 2022), This could be caused by the increase in fintech adoption not being accompanied by an increase in the number of customers using internet banking services, so costs related to infrastructure. Fintech, ongoing maintenance, and employee training are higher than the expected revenue from fintech services.

The BOPO variable of state-owned banks before and after collaborating with fintech startups shows significance. This proves that state-owned banks are becoming more efficient in business activities. On the other hand, the BOPO variable of Sharia banks before and after collaborating with fintech startups does not show significance, meaning that they could be more efficient in carrying out their business activities. According to (Sugiarto, 2012), fintech negatively influences a bank's financial performance during its development period. This result is because the market penetration level of fintech owned by banks is not yet so significant that it cannot reach all existing bank customers.

OPER analysis of Islamic banks shows an increase in OPER metrics, and operational costs have increased after the fintech collaboration. This could potentially be caused by the merger of these banks into Bank Syariah Indonesia (BSI).On the other hand, the OPER analysis of state-owned banks shows a decline, indicating a decrease in operational costs after the fintech collaboration, which impacts increasing efficiency. Our research on fintech's impact on OPER shows no significant difference between OPER before and after fintech collaboration. This is in line with the findings of (Siddik et al., 2016), who argue that operational costs such as printing, shipping, insurance and office supplies can decrease as technology investment increases, thereby impacting bank profitability.

RPE analysis of Islamic banks shows an increase in RPE metrics from before the fintech partnership to post-partnership. This shows that employee-related costs, which include salaries, benefits, training, bonuses, workforce adjustments, and customer base growth, have increased along with technology investments. This increase aligns with

p-ISSN: 2085-9643 DOI: 10.26740/jaj.v16n1.p15-p24
e-ISSN: 2502-6380 https://journal.unesa.ac.id/index.php/aj

expectations of increased profitability, as expanding the customer base often requires more workforce in Islamic banks.

In contrast, RPE analysis at state-owned banks shows a decline from before the fintech partnership and post-partnership, which shows decreased employee-related costs after technology investment. Our research on the impact of fintech on RPE shows no significant difference between RPE before and after fintech collaboration in state-owned and Sharia banks. These findings align with research (Roy et al., 2018), which states that technology investment affects profitability and bank performance. The researchers recommend implementing optimal technology-related strategies to increase banking productivity, such as technology backup planning, educating customers about technology-enabled products, and implementing employee motivation policies.

AUTHORSHIP CONTRIBUTION STATEMENT

The article's writers shared responsibilities for research, writing, and analyzing data.

REFERENCES

Al-azzawi, A. K. M., & Altmimi, L. A. (2015). Effect of information and communication technology investment on the profitability of the Jordanian commercial banks. *European Journal of Business and Management, 7(28), 166.*

Beccalli, E. (2014). *Information technology and economic performance: Some evidence from the EU banking industry.*

Central, B. E. (2016). The governing council of the European Central Bank. *Official Journal of the European Union, 79(3), 34–.*

Dita, Y. & F. I. (2019). The Effect of Internet Banking on Financial Performance at Conventional Commercial Banks Listed on the Indonesia Stock Exchange (Period 2015 - 2018). *Majalah Neraca, 121*.

Iman, N. (2020). The rise and rise of financial technology: The good, the bad, and the verdict. *Cogent Business & Management, 7(1), 1725*.

Khajehdangolani, S. (2011). The impact of information technology in banking system (a case study in bank Keshavarzi IRAN). *Procedia - Social and Behavioral Sciences, 30, 13–16.*

KPMG. (2012). *Financial report crime survey.*

Magaya, W. N. &. (2020). The Impact of Digital Banking Services on the Performance of Commercial Banks. *Journal of Management Information and Decision Science, 23(23),*

343–353.

Mayasari, Y. M. H. & G. E. H. (2021). The Effect of Internet Banking and Mobile Banking on Bank Financial Performance, Strategic. *Jurnal Pendidikan Manajemen Bisnis 21 (1) (2021) 55 – 72*.

Moridu, I. (2020). The Effect of Digital Banking on the Value of Banking Companies (Study on PT. Bank Negara Indonesia (Persero) Tbk). *Jurnal Riset Akuntansi, 3(2), 67–73.*

Ratnawati, T. D. W. (2020). The Effect of Financial Technology on the Profitability of Conventional Banks (Comparative Study of the Financial Statements of Bank BCA and Bank BRI before and after Cooperation with FinTech Start Ups). *Fakultas Ekonomi dan Bisnis Universitas Bhayangkara Surabaya*.

Roy Chhabra, N., Vishwanathan, T. (2018). Impact of technological disruption on workforce challenges of Indian banks – Identification, *Assessment & Mitigation. Retrieved from Http://Www. Iibf.Org.in/Documents/Final-161118.Pdf*.

Roy, N. C., & Thangaraj, V. (2019). Investment In Technology: Does It Proliferate The Profitability And Performance Of The Indian Banks? *Financial Issues in Emerging Economies: Special Issue Including Selected Papers from II International Conference on Economics and Finance, 2019, Bengaluru, India Research in Finance, Volume 36,*.

Sharma, D. (2012). Does technology lead to better financial performance? A study of Indian commercial banks. *Managing Global Transitions, pp. 10, 3–28., Retrieved*.

Shu, W., & Strassmann, P. A. (2005). Does information technology provide banks with profit? *Information & Management, 42, 781–78*.

Solikhin, A. N. (2021). The Effect of Financial Technology on Banking Profitability in Indonesia (Comparative Study of State-Owned Banks for the 2017-2019 Period). *Program Studi Manajemen Fakultas Ekonomi Dan Bisnis Universitas Muhammadiyah Surakarta*.

Sugiarto, A. (2012). Internet Banking Adoption for Banking Performance Excellence: A Study of the Banking Sector in Indonesia. *Jurnal Dinamika Akuntansi, 4(1), 13–19*.

Yanurisa Ananta, C. I. (2019). *Agar tak Kalah Saing, BUMN Bersatu Bikin Usaha Fintech*.

Yoo, S. (2017). Blockchain-based financial case analysis and its implications. *Asia Pacific Journal of Innovation and Entrepreneurship, 11(3), 312*.