

**Does fintech peer-to-peer lending undermine the profitability of Islamic banks?:
Empirical Evidence from Sharia Commercial Banks and Sharia Business Units in
Indonesia**

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Abstrak

Pinjaman *peer-to-peer* dalam sektor teknologi finansial telah mengalami perkembangan yang signifikan di Indonesia. Bank-bank syariah, yang tunduk pada prinsip-prinsip syariah, menawarkan perspektif yang berbeda dalam sektor pinjaman *peer-to-peer*. Penelitian ini bertujuan untuk menguji dampak pinjaman *peer-to-peer* terhadap profitabilitas bank syariah di Indonesia. Dataset terdiri dari 72 data runtun waktu bulanan dari bank umum syariah dan unit usaha syariah yang diperoleh dari Otoritas Jasa Keuangan (OJK) yang mencakup periode tahun 2018 hingga 2023. Model ECM digunakan untuk menilai durasi ketidakseimbangan jangka pendek yang akan bertahan dari waktu ke waktu. *Return on Asset* berfungsi sebagai variabel dependen, sedangkan variabel independen terdiri dari penyaluran pinjaman di *fintech P2P lending*, rasio biaya operasional, rasio kredit terhadap aset, jumlah kantor cabang, ukuran bank, dan tingkat suku bunga *BI rate*. Data menunjukkan bahwa fintech memiliki dampak yang signifikan dan positif terhadap operasional bank umum syariah. Variabel lain yang secara signifikan mempengaruhi ROA antara lain rasio biaya operasional (OER), rasio kredit terhadap aset, ukuran bank, dan *BI rate*. Temuan ini menyoroti pentingnya kolaborasi strategis antara platform pinjaman peer-to-peer dan lembaga-lembaga syariah.

Keywords: Fintech, P2P Lending, Bank Syariah, ROA, Profitabilitas Bank

Abstract

Peer-to-peer lending within the financial technology sector has undergone significant expansion in Indonesia. Islamic banks, complying to Sharia principles, offer a distinct perspective within the peer-to-peer lending sector. This study aims to examine the impact of peer-to-peer lending on the profitability of Islamic banks in Indonesia. The dataset consists of 72 monthly time series from sharia commercial banks and sharia business units, obtained from the Financial Services Authority (OJK) covering the period from 2018 to 2023. The ECM Model is employed to assess the duration of the short-term imbalance that will endure over time. The return on assets functions as the dependent variable, whereas the independent variables comprise loan disbursement in fintech P2P lending, operating expense ratio, loan-to-asset ratio, branch banking, bank size, and BI rate. The data indicated that fintech has a significant and positive impact on the operations of sharia commercial banks. Other variables that significantly influence ROA include operating expense ratio (OER), loan-to-asset ratio, bank size, and BI rate. This finding highlights the strategic importance of collaborations between peer to-peer lending platforms and Islamic institutions.

Keywords: Fintech, P2P Lending, Islamic Bank, ROA, Bank Profitability

Introduction

In recent times, there has been a remarkable advancement of information and communication technology, which has led to changes in consumer behavior for both financial and nonfinancial activities. This innovation will fulfil consumers satisfaction with providing the best comfort, speed, accuracy, ease of access, and efficiency. This revolution is moving rapidly, changing the economic structure and financial system globally, including in Indonesia. Indonesia's fintech industry is quite dominant in Southeast Asia. In 2022, the report released by UOB,PWC, and SFA noted that Indonesia received 33% of the total funding in Southeast Asia. This is an increase of 11 percentage points from the previous year, and it is second only to Singapore, which received 43% of total funding during the same period. According to the most recent statistics provided by OJK, there are 100 fintech companies licensed with OJK, which contains information on 94 conventional providers and 7 sharia providers, totalling IDR 7,029 billion in assets.

There are several types of fintech that are developing in Indonesia, including crowdfunding, microfinancing, P2P lending services, market comparison, and digital payment systems. Peer-to-Peer (P2P) lending has emerged as a highly favoured and widely adopted financial services (FinTech) innovation in Indonesia. Additionally, according to the Fintech in ASEAN 2023 report, peer-to-peer lending accounts for 84% of funding across all Fintech categories and is expected to dominate the Indonesian FinTech market. Peer-to-peer (P2P) lending systems have notable benefits, including facilitating easy loan access for individuals and small enterprises and promoting financial inclusion nationwide. Nevertheless, the emergence of peer-to-peer lending, has drastically affected the conventional banking industry.

The widespread adoption of financial technology (FinTech) worldwide illustrates this shift, offering both prospects and obstacles to conventional financial systems. This phenomenon has not only created new opportunities for financial services but also posed several obstacles. For instance, banks face increased competition, which may lead to a decline in profitability, as they are forced to lower interest rates and service charges to retain their customer base. The situation highlights the pressing necessity for banks to prioritize the improvement of profitability to maintain their operations and stay competitive in the market. The continuous expansion of the business has sparked a sustained discussion on the potential threat that FinTech, including P2P lending to both conventional banks and Islamic banks. This worry arises from the possibility of FinTech fundamentally changing conventional banking arrangements, prompting inquiries regarding its alignment with the principal of Islamic finance.

Insufficient research exists on the impact of fintech on profitability in Indonesia, particularly in terms of comparing Islamic commercial banks with Islamic business units. The present study's objective is to fill up the literature gap by using econometrical approach to investigate the impact of peer-to-peer (P2P) fintech lending on the profitability of Islamic banks , to determine whether it poses a challenge or an opportunity. This study adds to the continuing discussion on the convergence of FinTech and Islamic finance by providing a detailed comprehension of the interaction between contemporary financial innovations and Islamic banking concepts.

Literature Review

Zheng et al. (2023) examines the impact of innovative financial technology impelled inclusive finance on the profitability of banks in 40 emerging nations from 2011 to 2021. The group bank divided into conventional, Islamic, savings, and cooperative banks and the period of COVID-19 crisis. This indicates that inclusive finance powered by fintech can contribute to improving bank profitability, and conventional banks show a greater significant enhancement in profitability compared to Islamic and savings banks. During the COVID-19 era, the positive correlation between fintech and bank profitability was further reinforced. Conversely, Wahyuni et al. (2024) found negative impact of P2P lending is provoked amid the COVID-19 period. This outcome highlight the importance of synergy between P2P lending platforms and Islamic banks.

Lv et al. (2022) completed an empirical investigation in China. Evidence indicates that the profitability of banks is positively correlated with the growth of Fintech (FTI), bank assets (TA), net interest margin (NIM), credit risks (NPL), and cost control (CTI). This study also constructs the U curve to examine the impact of fintech on bank profitability at a significant levels of scale. This study reveals that during the early phases, the business models and customer resources of banks are negatively influenced by the development of Fintech. The sluggishness in technical progress and the insufficient incorporation of technology into company operations diminish the profitability of banks, despite their active involvement in this crucial phase of technological research. As the benefits of Financial Technology , such as its capacity to lower transaction costs and improve customer experience, continue to expand, the profitability of banks also increases.

Chen et al. (2020) undertook a study to determine whether the digital finance proxied by P2P (peer-to-peer lending) and third-party payment has a negative impact on profitability commercial banks. It results significant negative effect on the profitability of loans and deposits. This finding is just resemble with Phan et al. (2020) and Tobing & Wijaya (2020). Intense competition in the field of internet finance has resulted in a reduction in interest income from loans, an increase in interest costs from deposits, a fall in the growth rate of loans and deposits, and an increase in risk. The findings indicate that small banks are more susceptible to internet finance compared to major banks.

Wang et al. (2021) study fintech development and bank risk in China and find evidence that the development of FinTech worsen banks risk taking in general. This situation, involving technological investments such as the creation of a FinTech company by a commercial bank, typically requires substantial capital. However, the lengthy conversion cycle of technological advancements can place considerable financial strain on banks, elevating their short-term risk levels, reducing their profitability, and ultimately leading to greater risk exposure. As FinTech has evolved, more companies offering specialized financial services through cutting-edge technology have appeared.

Prior research in Indonesia was undertaken by Ath Thahirah & Kasri (2023) to examine the influence of P2P Lending on the performance of both conventional and Islamic banks. The analysis indicates Fintech P2P Lending has no significant influence on conventional banks, but it does have a beneficial effect on the performance of Islamic banks. Further investigation and empirical evidence suggest a cooperative and mutually beneficial association between Fintech P2P Lending and Islamic banks in Indonesia. In addition, Monika & Azam (2021) found that the advancement of Fintech had a positive influence on ROA of Private Islamic

Commercial Banks. This shows in accordance with consumer theory that the development of Fintech and ROA of Islamic Commercial Banks is complementary. Furthermore, Putri et al. (2024) discovered that fintech lenders pose a possible challenge to Islamic local banks due to their tendency to provide loans of comparable interest rates and appeal to similar customers. In order to mitigate the adverse effects of fintech, Islamic local banks should strive to uphold their efficiency at a proficient level.

Data and Methodology

This study utilized monthly time series data from 2018-2023 , with 72 observations for each Islamic Banking group, namely Sharia Commercial Banks (BUS) and Sharia Business Units (UUS). The period was selected based on the availability of secondary data retrieved from the Financial Services Authority (OJK) and Bank Indonesia (BI) with the following details:

Table 1. Data and Sources

No	Variable	Description	Source
1	Return on asset (ROA)	Net Profit/Total Asset	Financial Service Authority
2	Peer to Peer Lending (LOG P2PL)	Logarithm of Loan Disbursement to Borrowers (billion rupiahs)	Financial Service Authority
3	Operation Expenses Ratio (OER)	(Operating Expenses - Depreciation) / Gross Revenue.	Financial Service Authority
4	Loan to Asset Ratio (LAR)	Total Loan/Total Assets	Financial Service Authority
5	Branch Bank (LOG BRANCHBANK)	Logarithm of Number of Bank Branches	Financial Service Authority
6	Bank Size (SIZE)	Logarithm of Total Asset	Financial Service Authority
7	BI rate (BI RATE)	The standard rate has been appointed by Central Bank	Bank Indonesia

Bank profitability refers to the capacity of a bank to produce profits. According to Phan et al. (2020) performance of a bank can be described by three variables: ROA, ROE, and NIM. Based on research conducted by Zheng et al. (2023), ROA shows the best projector for bank profitability. The rationale Return on Assets (ROA) is selected as a performance metric because it is employed to evaluate the overall profitability of bank management. The higher the bank's return on assets (ROA), the more profit it generates and the more advantageous its assets are. The use of this variable is also in line with the research used by Ath Thahirah & Kasri (2023) and Monika & Azam (2021). Peer-to-peer lending as FinTech variable can be measured with the growth of loan disbursement (Wahyuni et al., 2024)the total of fintech P2P lending companies (Ath Thahirah & Kasri ,2023), or the creation of a financial technology index Lv et al. (2022). This study proxied FinTech variable with the total amount of loan disbursement in billion rupiahs.

In order to avoid bias in measuring the bank's performance, this study included various independent variables as internal factors, such as Operation Expenses Ratio (OER), which is the ratio of operating expenses to operational income and is intended to be negative. In addition, loan to asset ratio (LAR) is used to quantifies the bank's capacity to meet credit demand by utilizing its total assets (Sasmita Nugraha et al., 2019) which is intended to be positive or negative. Branch bank refers to the quantification of the branch banks that are distributed around Indonesia. Bernini & Brighi (2018) presented evidence that greater branches could enhance bank's earnings through the financial inclusion where expansion in branch networks will also increase the banks cost especially in the cost of investment and human capital, which is this variable possible to be positive or negative. Research conducted by Wang et al. (2021) uses bank size, the logarithm of total assets, as a measure of market economies of scale or diseconomies that is expected to have a positive sign. Consequently, bank performance is often influenced by the dynamics of a country's economy and nominal interest rates are part of monetary policy and are thought to affect ROA variables in general. To capture the effect of macro variables, this study uses the BI rate, which can have a positive or negative effect on ROA.

To address the research objectives, the Error Correction Model (ECM) is selected to capture the trend and seasonal in the time series data. This model is effective in correcting short-term imbalances in the long run through cointegration. The choice of the ECM is based on prior research by Lv et al. (2022), which demonstrates its ability to manage spurious regression issues that arise from non-stationary time series data. Regression models are developed for both Sharia commercial banks (BUS) and Sharia business units (UUS) to examine the impact of P2P lending. Additionally, descriptive analysis provides a factual depiction of each variable to support the regression results. The following sections outline the steps of the analysis using the ECM model :

1. Perform a stationarity test on all variables using the Augmented Dickey-Fuller (ADF) test. To apply the ECM model, all variables that are not stationary at the level must become stationary at the first difference, I(1). When all variables are stationary at I(1), the OLS regression formed with variables that are not stationary at the level will be meaningful, or "cointegrated," if the residuals of the OLS regression results are stationary at the level. In the ECM model, this cointegrated OLS estimation equation is referred to as the long-term equation.
2. The formation of a long-term model is clearly defined as follows :

$$ROA_t = \beta_0 + \beta_1 \text{LOGP2P}_t + \beta_2 \text{OER}_t + \beta_3 \text{LAR}_t + \beta_4 \text{LOGBRANCHBANK}_{it} + \beta_5 \text{BANK SIZE}_t + \beta_6 \text{BI RATE}_{t+} \varepsilon_{it} \dots \dots \dots (1)$$

Description :

β_0	: Constant
ROA_t	: Return on Asset
$P2P_t$	: Loan Disbursement to Borrowers
OER_t	: Operating Expenses ratio
LAR_t	: Loan Asset Ratio
$BRANCHBANK_t$	: Number of branch bank
$BANKSIZE_t$	: Logarithm of Total Aset

BI RATE_t : Nominal interest rate

3. Conduct cointegration testing. This testing is performed on the residuals derived from long-term equations using the ADF test. If the residual series is stationary at the I(0) level, all variables are considered cointegrated, allowing the ECM model to be applied. If the ECM model is applicable, the next step is to develop a short-term model.
4. Formation of a short-term model. The short-term model to be estimated in this study is

$$\Delta ROA_t = \beta_0 + \beta_1 \Delta LOGP2P_t + \beta_2 \Delta OER_t + \beta_3 \Delta LAR_t + \beta_4 \Delta LOGBRANCHBANK_t + \beta_5 \Delta BANK\ SIZE_t + \beta_6 \Delta BI\ RATE_t + \lambda ECT_{t-1} + \varepsilon_t \dots\dots\dots(2)$$

Description :

ECT_{t-1} : Error correction term

5. In the ECM model, the λ value must be statistically significant and negative and less than one. If these conditions are violated, the variables in the study will move further away from equilibrium, meaning that there is no cointegration in the long run.
6. After the long-term model is obtained, the next step is to test the significance of parameters in both the short-term and long-term equation models using the F-test (simultaneous) and t-test (partial).
7. The OLS equation model undergoes a classical assumption test by performing a normality test with the Jarque Bera test, a non-autocorrelation test with the Durbin Watson test, a homoscedasticity test with the Breusch-Pagan-Godfrey test, and observing non-multicollinearity with the correlation matrix

Result and Discussion

Descriptive Analysis

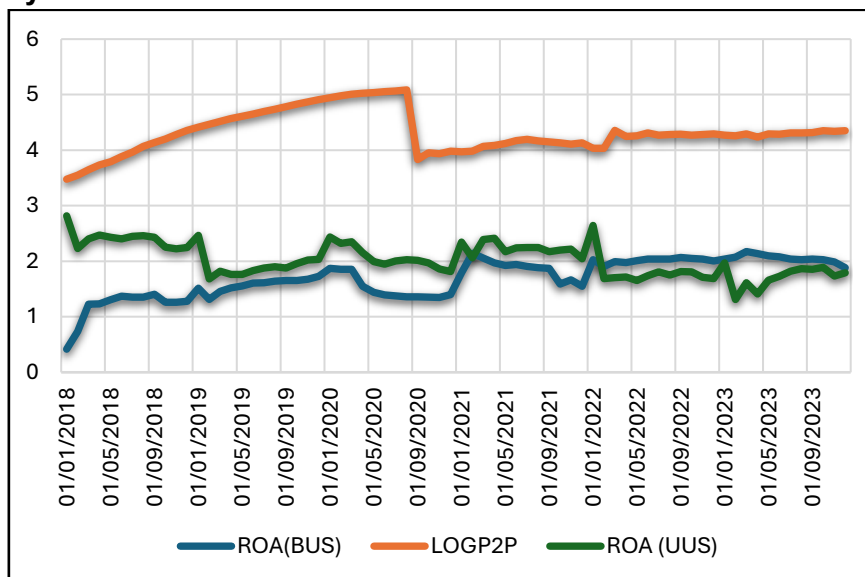


Figure 1. Overview of Return on Asset (ROA) and Peer to peer lending (P2P Lending)

ROA is a performance metric used to evaluate a bank's ability to produce overall profit. In summary, it can be inferred that ROA for sharia commercial banks and sharia business units follow a similar pattern and fluctuate between 2018 and 2023. The average ROA for BUS

is 1.70 percent, while SBU is 2.03 percent. This indicates that sharia business units are more profitable than sharia commercial banks. The higher the ROA acquired, the higher the level of profit obtained at the bank, so improving the bank's position in the usage of available assets.

The graph shows the increase in ROA occurred at the beginning of every year. It concludes that the quality of assets at the beginning of the year improved mainly along with the continued growth of loans and healthy profit income. The significant decrease of ROA occurred in 2020, which shows a condition where profit growth is lower than the assets themselves. The decline in profit simultaneously occurred since the dynamics of the COVID-19 economy had suppressed the benchmark interest rate until it continued to increase and had an impact on the cost of funds for banks at that time.

Furthermore, the quantity of loans supplied by FinTech P2P lending companies reduced dramatically in 2020. The COVID-19 pandemic had an impact on all sides, including peer-to-peer lending. However, the P2P lending graph then displays a growing trend since some FinTech lenders worked as banking partners to channel funds through the National Economic Recovery (PEN) program. During the investigation period, investigators discovered that a fintech company disbursed the highest loan amount of 22,830 billion rupiah in April 2022.

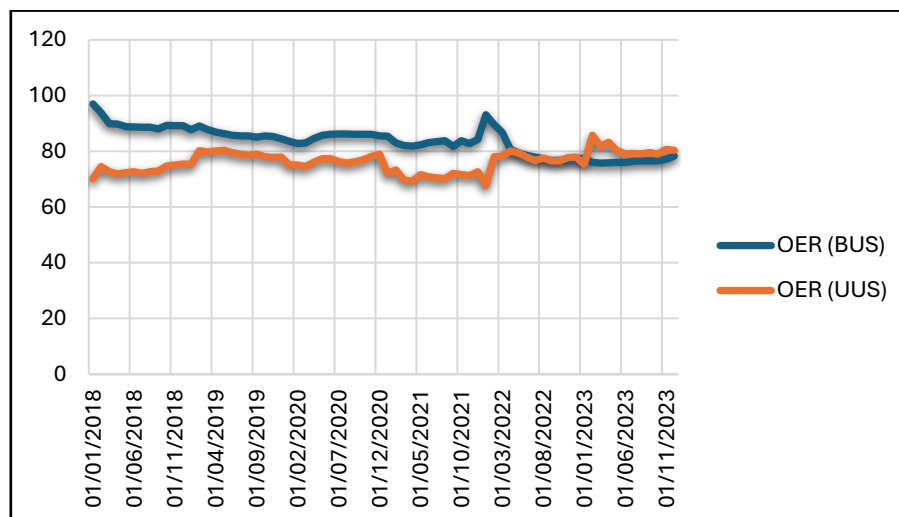


Figure 2. Overview of Operating Expenses Ratio (OER)

Operating Expenses Ratio (OER) is the ratio of operating expenses to total operating income. This ratio is employed to quantify the degree of effectiveness and the bank's capacity to execute its operational initiatives. The higher the OER ratio, the lower the bank's performance. Based on the graph, it can be concluded that OER for sharia commercial banks and sharia business units have the same pattern. In general, the OER figure for sharia commercial banks is higher than that of sharia business units, which is in line with the negative effect given by OER to the ROA variable in the previous analysis.

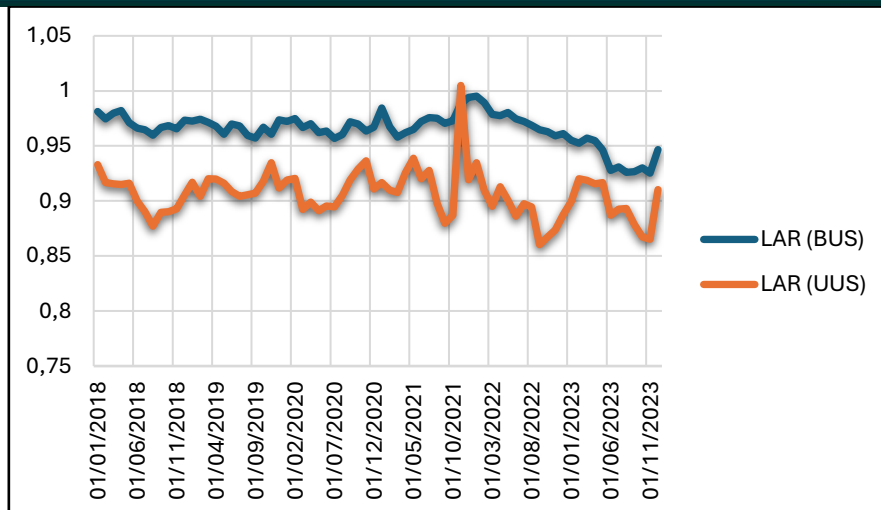


Figure 3. Overview of Loan Asset to Ratio (LAR)

The credit capacity of the bank is determined by the ratio of total loans to total assets. It is imperative that we assess the bank's capacity to satisfy credit demand. The graph indicates that the loan size of sharia commercial banks (BUS) and sharia business units (BUS) follow a consistent pattern, despite a significant increase in October 2021. According to this figure, the loan size at sharia commercial banks is greater than that of sharia business units. Consequently, the bank will generate a higher interest income as a result of the increased credit provided, which will result in a higher return on assets and an increase in ROA.

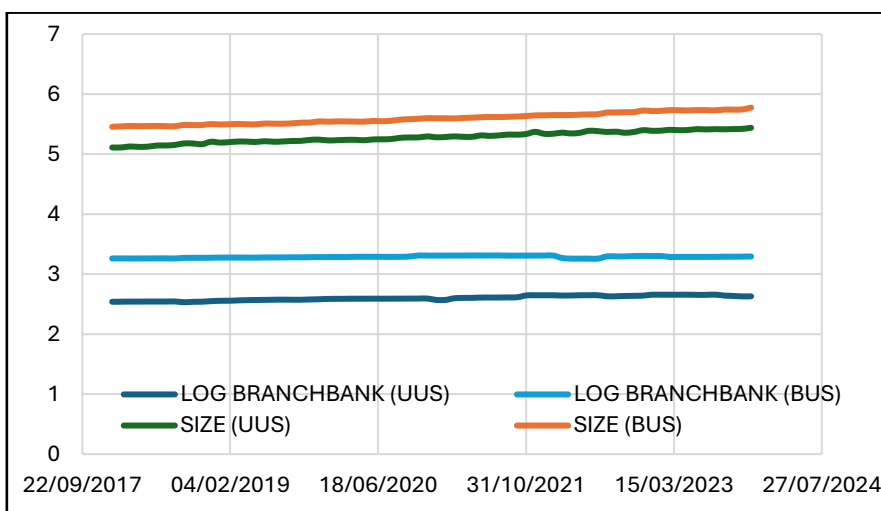


Figure 4. Overview of Bank Size and Branch Bank

It is evident from the graph above that sharia commercial banks generally have a greater number of offices than sharia business units. The substantial number of branch offices demonstrated the financial inclusion and enhancing its performance (Shihadeh & Liu, 2019). In addition, the size variable denotes the logarithm of total asset, which is employed to account for scale economies or diseconomies in the market. According to the prior research, there is a positive correlation between the size of a banks and its performance. The figure above illustrates that sharia commercial banks are larger than sharia business units.

Stationary test

The ADF stationarity test results that all variables proposed are stationary at the first difference. This can be seen from the probability value which is smaller than the five percent significance level so that hypothesis testing results in the decision to reject H_0 which means the data is stationary.

Table 2. Stationarity Test Result

Variable	Sharia Commercial Bank		Sharia Business Unit	
	I (1)	Result	I (1)	Result
ROA	0.0034	Stationary*	0.0001	Stationary*
LOGP2P	0.0000	Stationary*	0.0000	Stationary*
OER	0.0000	Stationary*	0.0001	Stationary*
LAR	0.0000	Stationary*	0.0001	Stationary*
SIZE	0.0001	Stationary*	0.0061	Stationary*
LOGBRANCHBANK	0.0000	Stationary*	0.0000	Stationary*
BI RATE	0.0022	Stationary*	0.0022	Stationary*

Estimation of the Long-term Equation

Table 3. Long-Term Estimation Result

Variable	Sharia Commercial Bank		Sharia Business Unit	
	Coefficient	Prob	Coefficient	Prob
C	-7.3885	0.0854	11.3850	0.0000*
LOGP2P	0.1347	0.0344*	0.0422	0.2137
OER	-0.0445	0.0000*	-0.0754	0.0000*
LAR	5.0111	0.0284*	0.5384	0.3663
BANKSIZE	1.3471	0.0085*	-0.7707	0.0885
LOG BRANCHBANK	-0.0196	0.7479	-0.2040	0.8453
BI RATE	-0.0158	0.5907	0.0672	0.0001*
F statistic	36.316		108.10	
Prob F statistic	0.0000		0.0000	
R-squared	0.7702		0.9089	

Adjusted R-squared	0.7490	0.9005
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Equation for Sharia Commercial Banks (BUS)

$$ROA_t = -7.3884 + 0.1347 \text{ LOGP2P}_t - 0.0445 \text{ OER}_t + 5.0111 \text{ LAR}_t + 1.3471 \text{ BANKSIZE}_t - 0.0196 \text{ LOGBRANCHBANK}_t - 0.0158 \text{ BI RATE}_t \dots (3)$$

Equation for Sharia Business Units (UUS)

$$ROA_t = 11.3850 + 0.0422 \text{ LOGP2P}_t - 0.0754 \text{ OER}_t + 0.5384 \text{ LAR}_t - 0.7707 \text{ BANKSIZE}_t - 0.2041 \text{ LOGBRANCHBANK}_t - 0.06721 \text{ BI RATE}_t \dots (4)$$

The long run regression model for sharia commercial banks indicates a positive impact of P2P Lending on Return on Assets (ROA). Each incremental rise of one percent in the loan disbursement by fintech firms will boost 0.13 in the Return on Asset at Sharia commercial banks. This study validates the findings of Ath Thahirah & Kasri (2023) , Monika & Azam (2021) about the positive impact and the effectiveness cooperation between sharia commercial banks and peer-to-peer lending firms. This finding diverges from prior studies undertaken by Chen et al. (2020), Phan et al. (2020) , Tobing & Wijaya (2020), which concluded that the presence of financial technology operates a lending paradigm, hence it can disrupt the function of banking financial institutions. FinTech is regarded as a disruptive force that challenges the traditional banking sector. In some literature, FinTech is seen as a competitor in facilitating credit allocation. Consequently, the presence of FinTech as a competitor will affect the performance and stability of banks.

The result of this study indicate that FinTech does not pose a competition to banking, but rather serves as a supplementary tool, particularly for Islamic banking. In the philosophical context, unlike conventional banking, sharia finance does not treat money as a commodity but as having time-value. Muslims are expected to shun interest (*riba*) by prohibiting the obtaining of interest on money lent or the paying interest money borrowed. This principle has helped explain that money lending, which can add to the assets of conventional banks, operates in a fundamentally different way when done in a Shariah-compliant environment. According to Yuliana & Listari (2021) Islamic banks prefer to directly invest in the desired asset or venture through the sharia specific *musharakah* and *mudharabah*. The adaptable approach to the treatment of money can facilitate the utilization of money in innovative ways while being in accordance with Shariah principles. These factors may have contributed to the acceptance of FinTech-enabled P2P lending in the Islamic financial ecosystem.

In the Sharia business unit regression model, the LOG P2P variable proved positive but insignificant to the bank's profitability ratio. This indicates that for Islamic Business Units, P2P lending continues to function as a complement rather than a competitor to conventional banking. The lack of multiplier effect generated or the fact that fintech companies do not obtain a significant amount of funds from SBU might be contributed to the insignificant value.

Moreover, another factor that exerts a substantial impact on Return on Assets (ROA) is Operating Equity Ratio (OER). From the model, one percent rise in OER will result in a profit decrease of 0.04 percent for the sharia commercial banks. Furthermore, in sharia business

units every one percent increase in OER will reduce ROA by 0.07 percent. In line with the operational definition of the OER variable, which is the ratio of operating costs to operating revenue, this finding indicates that when operating costs increase, the bank's capacity to generate financing products for the community decreases, thereby reducing its profitability. Because of the significance of this variable, with a large enough contribution and not balanced with consistent efficiency from the bank, it is possible that the magnitude of this influence will be even greater in the future. Therefore, banks need to make efficiency to minimize operating costs and maximize their operating income. The negative impact of OER on Return on Assets (ROA) aligns with the findings of Yuliana & Listari (2021).

Furthermore, the Loan to Asset Ratio variable indicates a positive value in Sharia commercial banks. It means one percent increase in LAR will result in a 5.01 percent increase in ROA. In comparison to the other variables proposed in the model, this variable makes the greatest contribution to the accumulation of ROA. It can be inferred that sharia commercial banks are able to fulfill credit demand with their total assets. Conversely, research from Ath Thahirah & Kasri (2023) convinced the negative effect means the greater the credit channelled to the customers which increase profits for the bank. However, if the bank is not paying attention to the growth of total assets, the possibility of profit obtained is not appropriate.

The next variable that has a substantial impact in ROA is bank size which measured by the logarithm of total assets. As can be observe on figure 4, The bank size of BUS is larger than UUS. It proven the significant impact occurred on commercial banks (BUS) rather than business units (UUS). For every 1 percent increase in total assets, the return on assets (ROA) will increase by 1.35 percent. In addition, the size variable denotes the logarithm of total asset, which is employed to account for scale economies or diseconomies in the market. Banks that are larger in size have the ability to diversify their products and services more, which reduces the level of risk and leads to increased operational efficiency and performance (Djalilov & Piesse (2016)). This outcome is consistent with the research conducted by Lv et al. (2022), the growth of bank assets can potentially drive the growth of loan supply scale, therefore enhancing the profitability of banks.

The model also considers the impact of macro variables to determine the impact of economic dynamics on bank profitability ratios, in accordance with the research of Haddad & Hornuf (2023). Evidence shows that macro variables have a notable impact on sharia business units. Specifically, a one percent rise in the nominal BI rate results in a 0.067 percent increase in ROA. High interest rates (BI Rate) are a critical factor in the banking industry, as they affect the public's interest and desire to invest their funds in banking products. As the public invests more funds, the bank's capacity to distribute these funds in the form of credit increases. The amount of credit distributed will affect the bank's profitability (Nikita Sari, 2020).

According to F statistics, the probability of the variables proposed for sharia commercial banks and sharia business entities is less than the 5 % significance level, indicating that they simultaneously influence ROA. The sharia business unit regression model displays a higher R-square of 0.90, as named the coefficient of determination. This finding suggests that the variables included in the model can explain 90 % of the variation in the ROA variable, with the remaining 10 % being explained by other variables. The sharia commercial bank model accurately explains 77% of the variation in the ROA variable, with the remaining 23 % being attributed to other factors. This model is interpretable in accordance with

fundamental theory and phenomena, after considering the significance of t-test (partial), F statistics , and the level of significance of R-square.

Cointegration Testing

The cointegration test is conducted using the stationarity test with the ADF test on the residual series from the estimation results of the long-term equation. The following cointegration test results can be seen in table 4 below

Table 4. Cointegration Result

Group	Variable	t-statistic	Prob	Result
Sharia Commercial Bank	ε_{1t}	-4.814519	0.0001*	Stationary
Sharia Business Unit	ε_{2t}	-5.124733	0.0001*	Stationary

Based on the cointegration test results, the p-value is 0.0001, which is smaller than alpha 5 percent. This means that the residuals of the estimated long-term equation are stationary at the level so that short-term modelling can be built to capture the timeseries characteristics of the data used, because the short-term model will be cointegrated in the long run.

Estimation of the Short-term Equation (ECM)

Table 5. ECM Estimation Result

Variable	Sharia Commercial Bank		Sharia Business Unit	
	Coefficient	Prob	Coefficient	Prob
C	0.0270	0.1394	0.0044	0.6416
D(LOGP2P)	0.1039	0.2822	-0.0109	0.8421
D(OER)	-0.0205	0.0268*	-0.0846	0.0000*
D(LAR)	1.3611	0.5819	0.7299	0.0986
D(SIZE)	-2.3412	0.2912	-1.2834	0.0711
D(LOGBRANCH BANK)	-0.0026	0.9278	-1.2832	0.3570
D(BI RATE)	-0.0310	0.7068	0.0173	0.7251
ECT(-1)	-0.4187	0.0000*	-0.4986	0.0000*
F statistic	3.259792		98.2000	
Prob F statistic	0.005119		0.0000	
R-squared	0.265893		0.916045	
Adjusted R-squared	0.184326		0.906716	

ECM Model for Sharia commercial bank (BUS)

$$\Delta ROA_t = 0.0270 + 0.1039 \Delta LOGP2P_t - \mathbf{0.0205} \Delta OER_t + 1.3611 \Delta LAR_t - 2.3412 \Delta SIZE_t - 0.0026 \Delta LOGBRANCHBANK_t - 0.0310 \Delta BI\ RATE_t - \mathbf{0.4187} ECT_{t-1} \dots \dots \dots (5)$$

ECM Model for Sharia commercial bank (UUS)

$$\Delta ROA_t = 0.0044 - 0.0109 \Delta LOGP2P_t - \mathbf{0.0846} \Delta OER_t + 0.7299 \Delta LAR_t - 1.2834 \Delta SIZE_t - 1.2831 \Delta LOGBRANCHBANK_t + 0.0173 \Delta BI\ RATE_t - \mathbf{0.4987} ECT_{t-1} \dots \dots \dots (6)$$

Based on Table 5, it is possible to infer that in the short term, the probability of F statistics is less than 5 % significance level, meaning that all variables proposed in the ECM model for both sharia commercial banks (BUS) and sharia business units (UUS) simultaneously affect the dependent variable, ROA. Moreover, the sharia commercial banks (BUS) model has R^2 value of 0.26, indicating that the proposed variables only can account for 26% of the diversity in the ROA variable, while the remaining variance is accounted for by other variables. R^2 is quite small as demonstrated by the presence of numerous insignificant variables in this brief term. Conversely, the sharia business unit (SBU) model exhibits a much higher R^2 value of 0.91. It is indicating that 91% of the diversity in the ROA variable can be accounted for by other variables in the model. In addition, the partial t-test yields pertinent findings that can be substantiated by both theory and phenomena.

The ECM model incorporates differential terms that represent the impacts of short-term fluctuation in the variables. The $ECT(-1)$ coefficient is significant and negative with significance of 5%, as indicated by the equation. Consequently, the ECM model is interpretable. The lambda (λ) constant can be interpreted as the speed of adjustment, for the sharia commercial banks indicating that the imbalance in the short-term model will be rectified by 41.87 % in the subsequent period before advancing to a convergent equilibrium point in the long term (cointegration). In line with sharia commercial banks, the $ECT(-1)$ coefficient on sharia business units amounted to -0.4986. This means that the imbalance that occurs in the short-term model will be corrected with a speed of adjustment of 49.86% in the next period, the rest is corrected in other periods until it reaches an equilibrium point.

Although the log P2P variable has a positive effect on sharia commercial banks in the long term, it is insignificant in the short term. This suggests that the effect of the increase in the number of loan disbursement in P2PL FinTech companies is not yet significant enough to affect the profitability of banks. On the other hand, the log P2P variable provides negative but insignificant results in the short term on the sharia business units (SBU). This means that in the short term, if loan disbursement remains to grow, it can threaten the existence of banks. According to Zheng et al. (2023) this condition occurred since banks are unable to manage their assets for profit hence it will interfere the banking performance. This finding resembles the observation of Lv et al. (2022) who included the squared Fintech (FTI^2) variable to see the square effect in their study. During the early phases, the development of Fintech negatively impacts the business models and customer resources of banks. The delay in technological advancements and the inadequate integration of technology and business reduces the profitability of banks, even if they are actively conducting industrial research at this stage. Yet,

the profitability of banks steadily rises as the benefits of FinTech, such as reducing transaction costs and enhancing customer experience, continue to grow.

According to Nikita Sari (2020), The rise in FinTech will lead to a decline in banking assets and a corresponding decline in profit. This decline will be evident when the number of bank clients declines and shifts towards FinTech. Consequently, banking performance will deteriorate. The success of the company in generating earnings for its shareholders is evaluated by the ratio of net income to total equity. The bank will generate profits if its income exceeds its expenses, with credit or credit interest being the most significant source of income. FinTech is characterized by the use of advanced technology to provide banking services such as loans, remittances, and investments. Consequently, if FinTech P2P continues to grow without being offset by digital banking, it is probably that banking performance will decline.

The variable that proves a significant effect in the short term is OER, in Sharia commercial banks, any increase in operating costs by 1 percent will reduce ROA by 0.2 percent. While in UUS, every 1 percent increase in OER will reduce bank profitability by 0.08 percent. This means that from these two comparisons, the effect caused by the increase in operating costs is greater to Business Unit (UUS) than the Commercial Banks (BUS). Furthermore, in the short term other variables such as Loan to Asset Ratio, Bank Size, Branch bank, and BI rate have no effect in the short term, but their effect on ROA still shows the consistent sign with economic theory.

Classical Assumption Test

The test results show that all classical assumption tests have a p value greater than 5 % test level (α) which causes the test decision to fail to reject H_0 . From this result, it is concluded that the estimated equation meets all classical assumptions and is valid for interpretation.

Tabel 6. Classical Assumption test result

Assumption	Statistical Tests	<i>p-value</i> <i>BUS</i>	<i>p-value</i> <i>UUS</i>
Normality	Jarque Berra	0.0599	0.2705
Homoscedasticity	<i>Breusch Pagan Godfrey</i> (BPG) t	0.0561	0.3310
Non autocorrelation	<i>Breusch Pagan Godfrey serial correlation</i> – LM	0.1493	0.2177
Non multicollinearity	There is no partial correlation greater than 0.8.		

Conclusion

The statistical modelling reveals that P2P lending does not diminish the profitability of Islamic banks, but rather enhances it. Sharia commercial banks have confirmed the significance of this result in the long term. This indicates that P2PL acts as a complement, not a competitor, to Islamic banking institutions. The principles of sharia commercial banks ensure that the emergence of fintech does not negatively impact the overall performance of these institutions. Islamic banks operate under a framework that prohibited *riba*, emphasizing alternative methods for credit repayment rather than relying on interest. Other variables that demonstrated significant influence on bank profitability include OER, this variable proved significant in the long and short term for both Islamic commercial banks and Islamic business units. It's crucial to effectively manage operating costs to sustain bank profits, as high operating costs have the potential to diminish bank profits. Furthermore, the Loan to Asset Ratio and Bank Size variables proved to have a long-term effect on Islamic commercial banks, while the influence of macro variables, namely the BI rate, proved to have a long-term effect on sharia business units.

The results of this study contribute to understanding the influence of fintech P2P lending on the performance of Islamic banks in Indonesia. The study underscores the importance of strengthening collaboration and coordination between banks and fintech firms to maintain this beneficial influence, which could potentially extend beyond Islamic banking to conventional banking in the future. In addition, technological advancement is necessary, as it has been demonstrated to have a significant impact on banks. Furthermore, P2P lending may help investment financing in Indonesia. Regarding the results mentioned earlier, this study also contains plenty of limitations. The analysis focusses on two specific types of Islamic banks, necessitating a comparative evaluation to assess their impact on Islamic financial institutions can be re-evaluated by incorporating BPRS. Likewise, the total loan disbursement encompasses all fintech. If the relevant data is accessible, it may be beneficial to analyze the impact on Islamic finance by selecting Islamic fintech exclusively. Additionally, employing other econometric models recommended by prior research, such as panel models, could be advantageous. Future research may also investigate the influence of fintech not just on peer-to-peer lending but also on other forms of fintech, affecting both the bank's operational framework and the overall economy.

References

- Ath Thahirah, F., & Kasri, R. A. (2023). Does fintech threaten Islamic banking performance in Indonesia? *Journal of Islamic Accounting and Finance Research*, 5(1), 65–86. <https://doi.org/10.21580/jiafr.2023.5.1.13745>
- Bernini, C., & Brighi, P. (2018). Bank branches expansion, efficiency and local economic growth. *Regional Studies*, 52(10), 1332–1345. <https://doi.org/10.1080/00343404.2017.1380304>
- Chen, Z., Li, K., & He, L. Y. (2020). Has Internet Finance Decreased the Profitability of Commercial Banks?: Evidence from China. *Emerging Markets Finance and Trade*, 56(13), 3015–3032. <https://doi.org/10.1080/1540496X.2019.1624159>
- Djalilov, K., & Piesse, J. (2016). Determinants of bank profitability in transition countries: What matters most? *Research in International Business and Finance*, 38, 69–82. <https://doi.org/10.1016/j.ribaf.2016.03.015>

- Haddad, C., & Hornuf, L. (2023). How do fintech start-ups affect financial institutions' performance and default risk? *European Journal of Finance*, 29(15), 1761–1792. <https://doi.org/10.1080/1351847X.2022.2151371>
- Lv, S., Du, Y., & Liu, Y. (2022). How Do Fintechs Impact Banks' Profitability?—An Empirical Study Based on Banks in China. *FinTech*, 1(2), 155–163. <https://doi.org/10.3390/fintech1020012>
- Monika, A., & Azam, A. N. (2021). The Impact of Fintech Development to Profitability of Islamic Bank. *International Journal of Research and Review (Ijrrjournal.Com)*, 8, 1.
- Nikita Sari (2020). *The Effect of the Growth of Financial Technology Companies Peer To Peer Lending on the Performance of Banking in Indonesia*.
- Phan, D., Kumar, P., Akhis, N., Hutabarat, R., Narayan, K., & Hutabarat, A. R. (2020). *DO FINANCIAL TECHNOLOGY FIRMS INFLUENCE BANK PERFORMANCE?*
- Putri, V. A., Futri, I. N., Risfandy, T., Reniati, R., & Fazlurrahman, H. (2024). How Does Fintech Lending Affect Islamic Local Banks' Efficiency During COVID-19 Pandemic in Indonesia? *International Journal of Economics and Management*, 18(1), 127–143. <https://doi.org/10.47836/ijeam.18.1.09>
- Sasmita Nugraha, Y., Ay, B., & Damayanti, R. (2019). *DI PT BANK RAKYAT INDONESIA (PERSERO) Tbk CABANG WONOGIRI TAHUN 2018* (Vol. 03, Issue 02).
- Tobing, J. D. T., & Wijaya, C. (2020). The effect of peer-to-peer lending and third-party payments on conventional commercial bank profitability in Indonesia. *International Journal of Management*, 11(5), 691–701. <https://doi.org/10.34218/IJM.11.5.2020.062>
- Wahyuni, S., Bustami, A., Fitriah, R. R. A., Af, M. S. F., & Yudaruddin, R. (2024). The impact of fintech peer-to-peer lending and Islamic banks on bank performance during COVID-19. *Banks and Bank Systems*, 19(1), 195–207. [https://doi.org/10.21511/bbs.19\(1\).2024.17](https://doi.org/10.21511/bbs.19(1).2024.17)
- Wang, R., Liu, J., & Luo, H. (2021). Fintech development and bank risk taking in China. *European Journal of Finance*, 27(4–5), 397–418. <https://doi.org/10.1080/1351847X.2020.1805782>
- Yuliana, I. R., & Listari, S. (2021). Pengaruh CAR, FDR, Dan BOPO Terhadap ROA Pada Bank Syariah Di Indonesia. *Jurnal Ilmiah Akuntansi Kesatuan*, 9(2), 309–334. <https://doi.org/10.37641/jiakes.v9i2.870>
- Zheng, C., Rahman, M. A., Hossain, S., & Moudud-UI-Huq, S. (2023). Does Fintech-Driven Inclusive Finance Induce Bank Profitability? Empirical Evidence from Developing Countries. *Journal of Risk and Financial Management*, 16(10). <https://doi.org/10.3390/jrfm16100457>