

ISLAMIC FINANCING AND BANK PERFORMANCE: EVIDENCE FROM INDONESIAN ISLAMIC BANKS

LAYLAN SYAFINA¹, ERLINA², ISKANDAR MUDA³, ARI IRAWAN⁴

¹UNIVERSITAS ISLAM NEGERI SUMATERA UTARA

^{2,3}UNIVERSITAS SUMATERA UTAR

⁴UNIVERSITAS IBBI

EMAILS: laylansyafina@uinsu.ac.id ¹, erlina@usu.ac.id ², iskandarmuda@usu.ac.id ³, ari251176@gmail.com ⁴

Abstract

The purpose of this research is to analyze the influence of mudharabah financing, murabahah financing and musyarakah financing on the profitability of Islamic banks in Indonesia as proxied by ROA both partially and simultaneously. The research methodology uses quantitative research where secondary data is used in the form of ROA data, mudharabah financing, murabahah financing, and musyarakah financing using a time span from 2021 to 2024 using monthly data. Data processing uses the Eviews 10 application with classical assumption testing and hypothesis testing. The results show that mudharabah financing has no influence on the profitability of Islamic banks. Murabahah financing has a significant influence on the profitability of Islamic banks. Musyarakah financing has a significant influence on the profitability of Islamic banks. The simultaneous test shows that mudharabah financing, murabahah financing and musyarakah financing have a significant influence on the profitability of sharia banks.

Keywords : Mudharabah Financing; Musyarakah Financing; Murabahah Financing; Profitability

1. INTRODUCTION

Banks in Indonesia are classified into two major categories: conventional banks and Islamic banks. Islamic banks are further divided into two types, namely Islamic commercial banks and Islamic rural banks. Islamic banking holds significant potential for supporting the public in fulfilling various financing needs. Its development began with a bottom-up approach, meaning it emerged in response to public demand. Strong financial resilience and the ability to withstand economic shocks have become defining characteristics of Islamic banks (Saleem et al., 2025). Their foundational principles and business models, which are derived from Islamic Sharia law, differ greatly from interest-based conventional systems. Most notably, the structure of Islamic banks' assets and liabilities is governed by a variety of Sharia contracts that are supported by partnership-based or sales-based arrangements.

Islamic banking has grown rapidly and has become an important player in the global financial sector (Rafay & Farid, 2017). The industry has expanded exponentially in terms of assets, deposits, financing, investments, branch networks, and customer bases. The first Islamic bank in Indonesia Bank Muamalat was established without a specific legal framework governing Islamic banking (Siswantoro, 2018). Its formation was initiated by Islamic scholars at the time and received strong support from the public.

Table 1. Total Assets of Islamic Commercial Banks (in billions of Rupiah)

No	Year 2024 (Month)	Total
1	February	586.591
2	March	603.782
3	April	593.452
4	May	598.089
5	June	606.887
6	July	603.288
7	August	607.000
8	September	619.810
9	October	619.810
10	November	630.153
11	Desember	664.611
	Year 2024 (Month)	Total
1	January	646.197
2	February	646.524
3	March	654.497

4	April	651.642
5	May	636.472
6	June	653.889

Source: Islamic Banking Statistics (2025)

Based on Table 1, the assets of Islamic commercial banks increased in March 2024, declined in April, and rose again in May. Monthly fluctuations continued, and in early 2025 assets decreased in January before rising in February and March. They then fell again in April and May, followed by another increase in June 2025. One of the factors driving financing growth is the interest-free (riba-free) system used by Islamic banks. In managing funds, Islamic banks allocate and distribute their resources through various financing activities designed to generate returns.

The primary financing schemes that generate profit through profit-sharing mechanisms include mudharabah, musyarakah, and murabahah (Zulfikar, 2019). The profits earned are then distributed between the bank and its customers in accordance with agreed-upon terms, and part of the bank's share is used to recover the initial capital invested (Wahyuningsih, 2019). During the prolonged pandemic period, many people relied on financing facilities either to maintain daily living needs or sustain their businesses. Financing therefore became an essential tool for individuals seeking to start or expand their enterprises. The financing instruments using profit-sharing mechanisms include mudharabah, musyarakah, and murabahah.

Musyarakah and mudharabah contracts (Rohman et al., 2021) are partnership based agreements in which both parties capital providers and entrepreneurs hold equal positions and share profits as well as risks. Approximately one-tenth of total Islamic financing is concentrated in murabahah, which is largely influenced by existing institutional frameworks (Miah & Suzuki, 2020). Unless current regulatory structures are revised, Islamic banks will continue to engage only to a limited extent in musyarakah or other full profit-and-loss-sharing (PLS) arrangements.

Mudharabah financing is a scheme in which the first party provides capital while the second party contributes expertise and management without injecting funds, and both parties share profits or losses from the venture (Putri, 2017). Thus, the income the bank receives from mudharabah financing affects its profitability; the higher the customer's profit, the greater the bank's earnings. However, according to (Muda et al., 2018), the effectiveness of mudharabah financing at BNI Syariah can be reflected in declining profitability. This is because mudharabah carries risks that may harm the bank and affect the interests of depositors and other users, even though it is carried out according to Sharia principles. Musyarakah financing, on the other hand, involves both the bank and customers contributing capital to a joint venture. Therefore, as the bank increases its allocation to musyarakah financing, its profitability also tends to rise because the bank receives a higher portion of the revenue generated (Romdhoni & Yozika, 2018). Additionally, (Suryadi & Burhan, 2022) note that when losses occur, the losses are shared proportionally among all parties, resulting in musyarakah being considered relatively less risky.

A bank's profitability performance can be assessed through its financial statements. Profitability ratios measure the ability of a business to generate income in a given context, while efficiency ratios assess how effectively a company utilizes its resources to earn profits (Uddin et al., 2022). One of the commonly used indicators is the Return on Assets (ROA). Financial statement analysis enables stakeholders to understand the bank's financial developments, both past and present (Ningsih & Rachmawati, 2019). Since investors aim to obtain returns in the form of capital gains and cash dividends, fundamental analysis of financial ratios is necessary. Evaluating the Return on Assets (ROA) provides important signals to investors and can be used as a key consideration when making investment decisions (Tetep et al., 2022).

ROA is used to measure profitability because it reflects the bank's capacity to generate operational income as a whole. Bank Indonesia also prioritizes ROA over ROE when assessing banking soundness. This is because ROA more accurately represents profitability derived from assets funded largely by public deposits. Consequently, a higher ROA indicates greater profits earned by the bank (Taslim, 2021). Based on the background above, the purpose of this study is to examine the influence of mudharabah, musyarakah, and murabahah financing on the profitability of Islamic banks in Indonesia

2. LITERATURE REVIEW

Profit and Loss Sharing Theory

Islamic scholars regard Profit and Loss Sharing (PLS) instruments particularly mudharabah and musyarakah as the core foundation of the Islamic banking model. Generally, the PLS model represents a partnership arrangement involving two or more parties (EL Fakir et al., 2019). In a mudharabah setting, Islamic banks accept funds from depositors under a risk-sharing agreement. The bank then invests these funds directly in profitable ventures or channels them to entrepreneurs under a similar risk-sharing arrangement. The profits or losses generated from mudharabah activities are distributed between the Islamic bank and its depositors.

In musyarakah financing, the bank contributes funds on behalf of its customers to form a joint venture with entrepreneurial clients. Typically, customers are entrusted with managing the business operations. Both the bank and the entrepreneur share any gains or losses derived from the musyarakah investment (Abubakar, 2017). Profit and Loss

Sharing Financing (PLS-F) refers to financing provided by Islamic banks that allows customers to manage and operate a business venture (Salman, 2023).

Return on Asset (ROA)

Return on Assets (ROA) is a profitability indicator used to measure how effectively a bank utilizes its total assets to generate earnings through operational activities (Romdhoni & Yozika, 2018). ROA reflects the overall return produced from all assets, regardless of the funding source, and is usually expressed as a percentage.

The primary purpose of ROA is to evaluate a bank's ability to generate profit before tax, based on the average total assets it holds. A higher ROA indicates stronger profitability and shows that the bank is using its assets more efficiently. Profit before tax represents net income earned from core operations prior to tax obligations (Sari & Sulaeman, 2021).

Mudharabah Financing

Mudharabah financing is a contractual partnership involving two parties: the capital provider and the business manager. Profits generated from the business are shared according to a predetermined profit-sharing ratio agreed upon at the beginning of the contract. If a loss occurs, the capital provider bears the financial loss, while the manager's loss is limited to the loss of effort and managerial time invested (Fadhila, 2015).

Mudharabah financing is fundamentally a trust-based arrangement that requires honesty, transparency, and fairness. Both parties must uphold integrity in fulfilling their respective responsibilities, particularly regarding profit distribution or loss-sharing. Sharia-based financing can be understood as the provision of funds to the public to overcome capital shortages for business activities in accordance with Islamic principles (Taudlikhul, 2017).

Musyarakah Financing

Musyarakah financing refers to a cooperative agreement in which two or more parties contribute capital to conduct a specific business venture. Profits are distributed according to ratios agreed upon at the outset, while losses are shared based on each party's capital contribution. This type of partnership requires a combination of various forms of capital tangible or intangible with possibly different contribution amounts. These capital contributions determine each party's share of profit. The measurement of musyarakah financing in Islamic banking is typically based on the proportion of total musyarakah financing relative to overall financing reported in the bank's financial statements (Faradilla et al., 2017).

Murabahah Financing

In Islamic banking, murabahah refers to a sale contract in which a product is sold at a price that includes the original cost plus a mutually agreed profit margin (Almanaseer et al., 2016). The selling price and margin are both disclosed and approved by the buyer and the seller. The level of the murabahah margin influences customer demand. A higher margin increases the cost of financing, which may reduce customers' interest in obtaining murabahah financing (Fadhila, 2015).

HYPOTHESES

H1: Mudharabah financing has an effect on the profitability of Islamic banks in Indonesia.

H2: Musyarakah financing has an effect on the profitability of Islamic banks in Indonesia.

H3: Murabahah financing has an effect on the profitability of Islamic banks in Indonesia.

H4: Mudharabah, musyarakah, and murabahah financing collectively influence the profitability of Islamic banks in Indonesia.

3. METHODS

Type of Research

This study employs a quantitative research method, which emphasizes the use of numerical data throughout the processes of data collection, interpretation, and presentation. The quantitative approach is accompanied by descriptive analysis to explain patterns and relationships observed in the dataset.

Types and Sources of Data

This research uses quantitative data, defined as numerical information that can be measured and expressed in numeric form. The study relies on secondary data, consisting of Return on Assets (ROA), mudharabah financing, musyarakah financing, and murabahah financing from 2021 to 2024. Monthly data for each variable were obtained from the official website of the Financial Services Authority (OJK) at www.ojk.go.id.

Population and Sample

The population of this study includes all Islamic commercial banks registered with OJK from 2021 to 2024. The study applies a saturated sampling technique, meaning that the entire population is used as the research sample. Thus, the dataset consists of 48 monthly observations covering the period 2021–2024.

Data Analysis Techniques

Data were collected using the documentation method. The analysis process began with classical assumption testing to ensure that the Ordinary Least Squares (OLS) regression model was free from classical assumption issues. The tests conducted include the normality test, multicollinearity test, heteroscedasticity test, and autocorrelation test.

Following this, hypothesis testing was carried out. Several statistical procedures were used, including the coefficient of determination test (R^2), the t-test for partial significance, and the F-test for simultaneous significance. All analyses were performed using the EVIEWS 10 software to process and evaluate the research data

4. RESULTS AND DISCUSSION

Results of the Classical Assumption Tests

The first test conducted was the normality test, which aims to determine whether the variables in this study are normally distributed. A data set is considered normally distributed when the calculated JB probability value is greater than 0.05, indicating that the residuals follow a normal distribution.

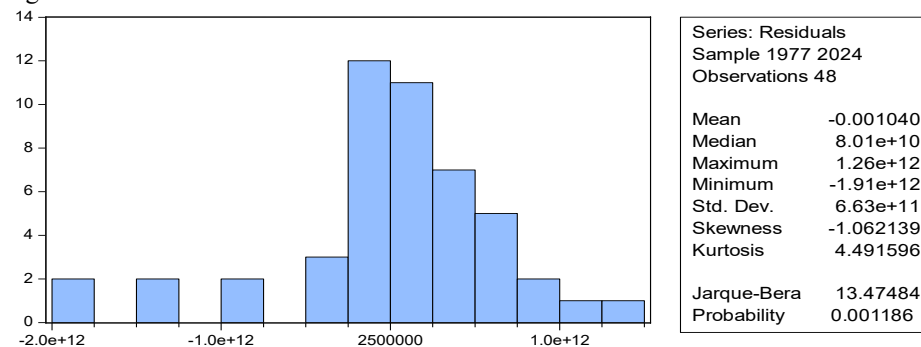


Figure 1. Normality Test Results

Based on the output, the JB probability value is 13.474, which exceeds 0.05. This result confirms that the residuals are normally distributed. The analysis then proceeds with the multicollinearity test to assess whether the independent variables are correlated with one another. A regression model is considered free from multicollinearity when the Variance Inflation Factor (VIF) value is below 10.

Table 2. Multicollinearity Test Results

	Coefficient	Uncentered	Centered
Variable	Variance	VIF	VIF
C	5.58E+23	57.01026	NA
MUDHARABAH	0.006053	88.06132	2.477166
MUSYARAKAH	1.47E-05	84.38980	3.272543
MURABAHAH	9.61E-06	47.85629	1.529918

Source: Processed data (2025)

The results show that the centered VIF values for mudharabah, musyarakah, and murabahah financing are 2.47, 3.27, and 1.52, respectively all below the threshold of 10. Therefore, it can be concluded that the model does not exhibit multicollinearity among the independent variables.

Table 3. Heteroscedasticity Test Results

Heteroskedasticity Test: Glejser			
F-statistic	1.754376	Prob. F(3,44)	0.1698
Obs*R-squared	5.128179	Prob. Chi-Square(3)	0.1626
Scaled explained SS	6.508728	Prob. Chi-Square(3)	0.0893

Source: Processed data (2025)

The Glejser test was used to examine heteroskedasticity. The probability value of the F-statistic is 1.754, which is greater than 0.05, indicating that the model does not suffer from heteroskedasticity. The next diagnostic test conducted

was the autocorrelation test using the Durbin–Watson approach. A model is considered free from autocorrelation when the probability value of the F-statistic exceeds 0.05.

Table 4. Autocorrelation Test Results

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.403871	Prob. F(2,41)	0.6704
Obs*R-squared	0.908058	Prob. Chi-Square(2)	0.6351

Source: Processed data (2025)

Based on the results presented, the F-statistic probability is 0.6704 (> 0.05), suggesting that no autocorrelation is present in the regression model.

Hypothesis Testing Results

The first hypothesis test examined the coefficient of determination (R-squared) to measure how much of the variation in the dependent variable can be explained by the independent variables.

Table 5. Coefficient of Determination Test Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.24E+12	7.47E+11	2.995906	0.0045
MUDHARABAH	-0.271493	0.077800	-3.489613	0.0011
MUSYARAKAH	0.044839	0.003829	11.71145	0.0000
MURABAHAH	0.001332	0.003100	0.429503	0.6697
R-squared	0.877864	Mean dependent var		9.77E+12
Adjusted R-squared	0.869537	S.D. dependent var		1.90E+12
S.E. of regression	6.85E+11	Akaike info criterion		57.42377
Sum squared resid	2.07E+25	Schwarz criterion		57.57970
Log likelihood	-1374.171	Hannan-Quinn criter.		57.48270
F-statistic	105.4182	Durbin-Watson stat		0.898388
Prob(F-statistic)	0.000000			

Source: Processed data (2025)

The regression results show an R-squared value of 0.8778, meaning that 87.78% of the variation in Islamic bank profitability can be explained by mudharabah, musyarakah, and murabahah financing. The next test, the t-test, was used to evaluate the partial effect of each independent variable on the dependent variable.

Table 6. t Test Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.24E+12	7.47E+11	2.995906	0.0045
MUDHARABAH	-0.271493	0.077800	-3.489613	0.0011
MUSYARAKAH	0.044839	0.003829	11.71145	0.0000
MURABAHAH	0.001332	0.003100	0.429503	0.6697

Source: Processed data (2025)

The probability value for mudharabah financing is 0.0011 (< 0.05), indicating a significant effect on Islamic bank profitability. Musyarakah financing also shows a significant influence with a probability value of 0.0000 (< 0.05). In contrast, murabahah financing yields a probability value of 0.6697 (> 0.05), demonstrating that it does not significantly affect profitability.

The final test, the F-test, evaluates whether all independent variables jointly influence the dependent variable.

Table 7. F Test Results

R-squared	0.877864	Mean dependent var	9.77E+12
Adjusted R-squared	0.869537	S.D. dependent var	1.90E+12
S.E. of regression	6.85E+11	Akaike info criterion	57.42377

Sum squared resid	2.07E+25	Schwarz criterion	57.57970
Log likelihood	-1374.171	Hannan-Quinn criter.	57.48270
F-statistic	105.4182	Durbin-Watson stat	0.898388
Prob(F-statistic)	0.000000		

Source: Processed data (2025)

The probability of the F-statistic is 0.000 (< 0.05), confirming that mudharabah, musyarakah, and murabahah financing simultaneously have a significant effect on Islamic bank profitability.

5. CONCLUSION, IMPLICATIONS, AND RECOMMENDATIONS

Conclusion

Based on the analysis conducted, the following conclusions are drawn:

1. Mudharabah financing has a significant effect on Islamic bank profitability, indicated by a probability value of 0.0011 (< 0.05).
2. Musyarakah financing significantly influences Islamic bank profitability, with a probability value of 0.000 (< 0.05). This supports the findings of Wahyuningsih (2019) and Pratama & Febriansyah (2020), who reported similar conclusions.
3. Murabahah financing does not significantly affect Islamic bank profitability, as reflected by its probability value of 0.6697 (> 0.05).
4. Collectively, mudharabah, musyarakah, and murabahah financing significantly influence Islamic bank profitability, as shown by the F-statistic probability of 0.000 (< 0.05).

Implications

The findings of this study are expected to provide valuable insights for stakeholders and parties involved in the Islamic banking industry, particularly those seeking information related to financing structures and profitability performance.

Recommendations

Several suggestions for future research include:

1. Future studies are encouraged to incorporate additional variables related to profitability beyond mudharabah, musyarakah, and murabahah financing such as istishna financing and other relevant indicators.
2. Researchers are advised to extend the research period and utilize more recent and comprehensive datasets.

BIBLIOGRAPHY

1. Abubakar, A. S. (2017). Islamic Banking And Investment Financing : A Case Of Islamic Banking In Kenya. *International Journal Finance*, 2(1), 66–87.
2. Almanaseer, S. R., Alslehat, Z., & Abdelfattah, R. (2016). The Impact of Financing Revenues of the Banks on their Profitability: An Empirical Study on Local Jordanian Islamic banks. *European Journal of Business and Management*, 8(12), 195–202. <https://ssrn.com/abstract=3558037>
3. EL Fakir, A., Fairchild, R., & Tkouat, M. (2019). A hybrid profit and loss sharing model using interest free-debt and equity financing: An application of game theory as a decision tool. *North American Journal of Economics and Finance*, 49(April 2018), 352–360. <https://doi.org/10.1016/j.najef.2019.04.017>
4. Fadhila, N. (2015). Analisis Pembiayaan Mudharabah Dan Murabahah Terhadap Laba Bank Syariah Mandiri. *Riset Akuntansi Dan Bisnis*, 15(1), 52–64.
5. Faradilla, C., Arfan, M., & Shabri, M. (2017). Pengaruh Pembiayaan Murabahah, Istishna, Ijarah, Mudharabah Dan Musyarakah Terhadap Profitabilitas Bank Umum Syariah Di Indonesia. *Jurnal Magister Akuntansi Pascasarjana Universitas Syiah Kuala*, 6(3), 9. <https://doi.org/10.19105/sfj.v1i1.4349>
6. Miah, M. D., & Suzuki, Y. (2020). Murabaha syndrome of Islamic banks: a paradox or product of the system? *Journal of Islamic Accounting and Business Research*, 11(7), 1363–1378. <https://doi.org/10.1108/JIABR-05-2018-0067>
7. Muda, I., Panjaitan, R., Erlina, E., Ginting, S., Maksum, A., & Abubakar, A. (2018). Model application of Murabahah financing acknowledgement statement of Sharia accounting standard No 59 Year 2002. *IOP Conference Series: Earth and Environmental Science*, 126(1). <https://doi.org/10.1088/1755-1315/126/1/012071>
8. Ningsih, W. F., & Rachmawati, L. (2019). Faktor-Faktor yang Mempengaruhi Profitabilitas pada Bank Pembiayaan Rakyat Syariah di Jawa Timur. *JABE (Journal of Applied Business and Economic)*, 5(4), 365. <https://doi.org/10.30998/jabe.v5i4.4185>
9. Pratama, Y. B., & Febriansyah, E. (2020). the Effect of Mudharabah, Musyarakah and Murabahah Finance on the

- Profitability of Sharia General Banks in Indonesia in 2013-2017. *BIMA Journal (Business, Management, & Accounting Journal)*, 1(1), 49–60. <https://doi.org/10.37638/bima.1.1.49-60>
10. Putri, F. L. (2017). Pengaruh Pembiayaan Mudharabah Terhadap Profitabilitas Bank Syariah. *Jurnal Pendidikan Akuntansi & Keuangan*, 5(1), 11. <https://doi.org/10.17509/jpak.v5i1.15384>
11. Rafay, A., & Farid, S. (2017). Dynamic relationship between islamic banking system and real economic activity: Evidence from Pakistan. *Journal of King Abdulaziz University, Islamic Economics*, 30(2), 97–116. <https://doi.org/10.4197/Islec.30-2.10>
12. Rohman, P. S., Fianto, B. A., Ali Shah, S. A., Kayani, U. N., Suprayogi, N., & Supriani, I. (2021). A review on literature of Islamic microfinance from 2010-2020: lesson for practitioners and future directions. *Heliyon*, 7(12), e08549. <https://doi.org/10.1016/j.heliyon.2021.e08549>
13. Romdhoni, A. H., & Yozika, F. El. (2018). Pengaruh Pembiayaan Mudharabah, Musyarakah Dan Ijarah Terhadap Profitabilitas Bank Muamalat Indonesia. *Jurnal Ilmiah Ekonomi Islam*, 4(03), 177. <https://doi.org/10.29040/jiei.v4i03.314>
14. Saleem, A., Zahid, R. M. A., & Sági, J. (2025). Differential impact of adopting Islamic banking: A quasi-experimental approach. *Research in International Business and Finance*, 76(February 2025). <https://doi.org/10.1016/j.ribaf.2025.102793>
15. Salman, K. R. (2023). The Determinants of Profit-Loss Sharing Financing of Islamic Banks in Indonesia. *Muqtasid: Jurnal Ekonomi Dan Perbankan Syariah*, 13(2), 95–111. <https://doi.org/10.18326/muqtasid.v13i2.95-111>
16. Sari, C. I. P., & Sulaeman, S. (2021). Pengaruh Pembiayaan Murabahah, Pembiayaan Mudharabah dan Pembiayaan Musyarakah Terhadap Profitabilitas. *Al Maal: Journal of Islamic Economics and Banking*, 2(2), 160. <https://doi.org/10.31000/almaal.v2i2.3111>
17. Siswanto, D. (2018). Sharia Accounting Standard for Sukuk (Islamic Bond) Accounting in Indonesia. *Journal of Islamic Accounting and Business Research*, 2(2), 117–126.
18. Suryadi, N., & Burhan. (2022). Pengaruh Pembiayaan Mudharabah, Murabahah, dan Musyarakah terhadap Profitabilitas dengan NPF Sebagai Variabel Moderasi Pada Bank Umum Syariah. *Management Studies and Entrepreneurship Journal*, 3(1), 169–183.
19. Taslim, S. A. (2021). Pengaruh Pembiayaan Bagi Hasil terhadap Tingkat Profitabilitas Bank Umum Syariah di Indonesia. *Jurnal Akuntansi Indonesia*, 10(1), 97. <https://doi.org/10.30659/jai.10.1.97-109>
20. Taudlikhul, A. (2017). Influence Analysis of Mudharabah Financing and Qardh Financing to the Profitability of Islamic Banking in Indonesia. *AJIE-Asian Journal of Innovation and Entrepreneurship*, 02(03), 2477–3824.
21. Tetep, T., Hermansyah, H., Supriyanto, D., & Hamdani, N. A. (2022). Analysis of Mudharabah, Musyarakah and Ijarah Partially to Return on Assets (ROA) in Islamic Banks. *Proceedings of the 6th Global Conference on Business, 22. Management, and Entrepreneurship (GCBME 2021)*, 657(Gcbme 2021), 26–29. <https://doi.org/10.2991/aebmr.k.220701.007>
23. Uddin, M. N., Rashid, M. H. U., & Rahman, M. T. (2022). Profitability, marketability, and CSR disclosure efficiency of the banking industry in Bangladesh. *Heliyon*, 8(11). <https://doi.org/10.1016/j.heliyon.2022.e11904>
24. Wahyuningsih, I. (2019). Menakar Dampak Pembiayaan Mudharabah Dan Musyarakah Terhadap Profitabilitas Return On Assets PT Bank Muamalat Indonesia Tbk. *AL-MASHRAFIYAH: Jurnal Ekonomi, Keuangan, Dan Perbankan Syariah*, 3(1), 15–26.
25. Zulfikar, S., SA, R., (2019). The Influence Of Sharia Financing And Third Party Funds On Capital Economic Growth And Income Per Capita. *International Journal of Scientific and Technology Research*, 8(9), 1268-1274.