Investigating the Impact of Monetary Policy on the Performance of Islamic Banks with Emphasis on the Moderating Role of Credit Risk

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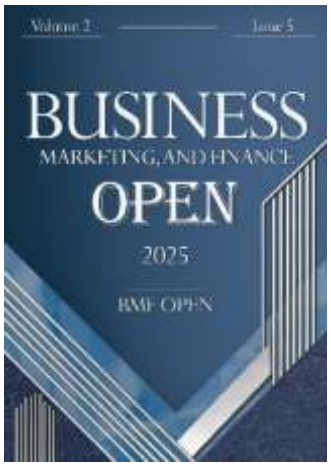

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Abstract: In recent years, the health and stability of the financial sector have gained special significance as one of the most critical domains of the economy in various countries worldwide. Accordingly, researchers and economic policymakers have been seeking ways to improve the performance of financial institutions, including the banking system. In this regard, the first step toward establishing a stable and sound banking system is to identify the determinants of bank performance. Among these, Islamic banks are distinct from other banks due to the prohibition of usury (riba) and the ban on interest, giving rise to a unique banking structure. Therefore, it is essential to examine the performance determinants of Islamic banks separately. Based on this, and considering the importance of bank profitability as the most significant financial intermediary on the one hand, and the unique structure of Islamic banks shaped by the distinctive rules of Islam—particularly the prohibition of interest—on the other hand, the present study aims to identify the determinants of profitability in Islamic banks. This study focuses on monetary policy and the moderating role of credit risk, analyzing data from 24 countries with Islamic banking systems over the period from 2013 to 2024, using the dynamic panel data regression approach with the Generalized Method of Moments (GMM). The results of this study indicate that inflation rate, credit risk, and the economic freedom index have a negative and significant impact on the profitability of Islamic banks. In contrast, economic growth, trade openness index, and monetary policy exhibit a positive and significant effect on profitability. Furthermore, the moderating role of credit risk in the relationship between monetary policy and bank profitability is found to be statistically significant.

Keywords: Islamic banking, monetary policy, Generalized Method of Moments (GMM), credit risk.

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1. Introduction

In recent decades, economic growth and development have become fundamental objectives for all countries across the globe. Consequently, policymakers have consistently sought to create the foundations for stable financial and economic markets in pursuit of economic expansion. One of the economic sectors whose health and stability can exert significant influence on a nation's overall economy is the financial sector. This importance stems from the fact that the financial sector is the primary source of funding for investment in various areas of the economy and is tasked with collecting small-scale financial resources and transforming them into large-scale capital for major investments [1-3].

Among the key elements of this sector, an efficient banking system can serve as the most vital tool within the financial structure, exerting considerable influence on the economic conditions of countries. Banks, through the allocation of financial resources, facilitate production activities and foreign trade, thereby contributing to economic development. Therefore, it can be asserted that bank performance significantly affects other sectors of a nation's economy [4]. The significance of a sound banking system and proper banking operations became more apparent during the 2007 global financial crisis and the collapse of prominent banks due to the erosion of public trust. It is also noteworthy that the role of banks in advancing economic activities is more pronounced in developing countries due to the scarcity of financial resources and the reliance of investors on receiving bank loans. Accordingly, improving bank performance and establishing a healthy banking system has always been a concern for policymakers and financial economists [5, 6]. A prerequisite for making informed decisions in this regard is an understanding of the causes and determinants affecting bank performance.

One of the most critical factors that unavoidably affects bank profitability is the monetary policies implemented by central banks. This importance arises because monetary policies, through altering the money supply available to the public and the reserves held by commercial banks, influence the incentives for lending and borrowing. In turn, this leads to the contraction or expansion of economic activities [7]. Therefore, monetary policy, in addition to its impact on macroeconomic variables such as economic growth and inflation rate, directly affects banking operations and profit margins. Furthermore, considering that bank profits serve as a buffer capital and fluctuations in profitability can alter a bank's safety margin, it can be argued that monetary policy also influences credit risk in banks. [8, 9]

The literature on the determinants of bank profitability and the role of monetary policy has grown substantially, with both international and domestic studies highlighting various contributing factors. Borio et al. (2017) examined 109 major international banks across 14 advanced economies from 1995 to 2012 and found a positive relationship between short-term interest rates, yield curve structure, and bank profitability, with a nonlinear interaction between yield curve and profit margins [10]. Ranajee (2018), analyzing Indian commercial banks between 2005 and 2015, reported that both internal (e.g., capital strength, operational efficiency) and external (e.g., GDP, inflation) factors influence profitability [11]. Taqiuddin Mohamad et al. (2019) used panel data for 17 Malaysian Islamic banks and identified capital ratios, financing losses, and liquidity as significant profitability drivers, with monetary policy variables like interbank discount rates playing mixed roles [12]. Mbabazize et al. (2020), applying two-step GMM for Ugandan banks (2010–2018), found significant causal effects of interest rate policy and inflation on profitability. Similarly, Umunna-Kanlan et al. (2021) confirmed a long-run negative relationship between interest rates and profitability in Nigerian banks using ARDL and ECM models, while highlighting a positive relationship with money supply [13]. Khan (2022) assessed banks in GCC countries and found that size, asset management, and economic growth positively influence returns, whereas capital adequacy and financial risks negatively impact profitability [14]. Qader Mohammad (2022) confirmed a significant positive effect of monetary policy on profitability in Iraqi banks, with varying magnitudes depending on the measurement index [6]. Data et al. (2023), using panel data from Indonesian banks, found that while monetary policy negatively impacts capital structure, its direct effect on credit risk is insignificant; however, both capital structure and credit risk adversely affect profitability [15]. Khoir (2024), using qualitative interviews in Indonesia, concluded that high interest rates suppress operational efficiency and credit demand, while accommodative monetary policy reduces non-performing loans via debt relief, unlike restrictive policies which increase them [1]. Among domestic studies, Shahabadi and Davari Kesh (2017), using 3SLS and Iranian data (1984–2014), confirmed the positive roles of GDP, liquidity, and economic

freedom on banking performance [16]. Afshari et al. (2017) showed that Islamic banks were more profitable than conventional ones during financial crises [7]. Sarlak et al. (2018), through BSC analysis of 250 Parsian Bank employees, found that overdue loans significantly affect financial and non-financial performance indicators [17]. Najafi Moghadam and Safa (2018) confirmed that credit risk significantly affects both liquidity and earnings management in Tehran Stock Exchange-listed banks [18]. Alizadeh and Larijani (2019) emphasized the positive mediating role of financial intelligence in the currency risk–performance relationship at Bank Mellat [8]. Ranji Jafroodi and Pourali (2021) showed that loan conditions, customer evaluation, and credit control policies significantly influence lending performance in Iran's Agricultural Bank branches [19]. Hamed Karim et al. (2022), using threshold vector autoregression, documented asymmetric monetary shocks on banking performance across MENA countries [20]. Lastly, Yousefi Ghaleh-Rodkhani et al. (2023), using panel regression for Iranian banks, found no significant effect of loan defaults and capital adequacy on return on equity but did confirm the impact of interest margin on asset returns, highlighting the nuanced nature of monetary and risk variables in shaping banking outcomes [2].

In this context, given the prohibition of usury (riba) and interest in Islam, Islamic banks have consistently sought legitimate forms of financing, reward distribution, and interbank and financial provider relations on one hand, and relations between banks and borrowers on the other. Therefore, Islamic banks, by replacing fixed interest rates with profit-sharing arrangements, operate differently from conventional banks. Nonetheless, despite the importance of this topic in Islamic banking, very few studies have examined the impact of monetary policies on the performance of Islamic banks. Moreover, no study has yet addressed the moderating role of credit risk in the relationship between monetary policy and the performance of Islamic banks. Accordingly, given the importance of commercial bank performance and the pivotal role of monetary policy in bank profitability on one hand, and the lack of sufficient empirical research concerning Islamic bank performance on the other, the present study aims to evaluate the impact of monetary policy on the profitability of Islamic banks in 24 countries, emphasizing the role of credit risk during the period from 2013 to 2024 using the panel data Generalized Method of Moments (GMM) approach.

2. Methodology

The model used in this study is an enhanced and modified version of the model proposed by Dita et al. (2023). It is worth noting that, given the cross-country nature of the present study, external and macroeconomic factors influencing bank profitability are examined. To conduct this research, data on bank profitability were collected from the databases of the Islamic Financial Services Board (IFSB), and other required variables related to countries with Islamic banking systems were obtained from the World Bank databases. Considering the necessity for an Islamic banking system and the availability of the required data, 24 countries were selected, including: Afghanistan, Bahrain, Bangladesh, Brunei, Egypt, Indonesia, Iran, Iraq, Jordan, Kazakhstan, Kyrgyzstan, Kuwait, Lebanon, Libya, Malaysia, Morocco, Nigeria, Oman, Pakistan, Qatar, Saudi Arabia, Sudan, Turkey, and the United Arab Emirates. Moreover, based on the availability of relevant statistics and information, a 12-year time period from 2013 to 2024 is analyzed in this study.

In general, based on previous theoretical and empirical studies and the adjusted model of Dita et al. (2023), the general pattern of bank profitability can be expressed by equation (1) as follows:

Equation (1)

$$P_{it} = f(MP_{it}, CR_{it}, CR_{it} * MP_{it}, GDP_{it}, INF_{it}, GOV_{it}, OP_{it})$$

Where *P_it* represents the return on total assets of banks in country *i* in year *t* as a proxy for bank profitability; *MP_it* denotes the change in liquidity volume as a proxy for monetary policy; *CR_it* is the ratio of non-performing loans to total loans as a proxy for credit risk; *GDP_it* stands for gross domestic product; *INF_it* indicates the inflation rate; *GOV_it* refers to government expenditure as a share of GDP as a proxy for economic freedom; and *OP_it* is the ratio of total exports and imports to GDP as an indicator of trade openness in country *i* and year *t*.

An important point to consider is that, according to the theories of domestic and international scholars such as Flamini et al. (2009), Liu and Wilson (2010), Dietrich and Wanzenried (2011), and Umunna-Kanlan et al. (2021), it is possible that the financial performance of banks is also influenced by the lagged values of the dependent variable. Accordingly, dynamic estimation of the model is of great importance. Therefore, to estimate the model, its linearized form with the inclusion of the lagged dependent variable is considered as equation (2):

Equation (2)

$$P_{it} = \beta_0 + \beta_1 MP_{it} + \beta_2 CR_{it} + \beta_3 (CR_{it} * MP_{it}) + \beta_4 GDP_{it} + \beta_5 INF_{it} + \beta_6 GOV_{it} + \beta_7 OP_{it} + \beta_8 P_{(t-1)} + \varepsilon_{it}$$

In this study, the dynamic panel data model is estimated using the Generalized Method of Moments (GMM). This method is one of the key econometric approaches widely used in panel data estimation. The reason for this is that the method is highly flexible and requires fewer initial assumptions compared to other methods. The GMM estimator for panel data is applied in equations where, first, the lagged dependent variable appears as an independent variable on the right-hand side of the equation, and second, the estimation of unobservable individual effects for each period and the existence of a lagged dependent variable among the explanatory variables constitute a fundamental challenge (Barro & Lee, 1996). The Generalized Method of Moments is employed to resolve estimation issues related to autocorrelation and heterogeneity.

In general, it can be stated that static panel data regression methods face issues of autocorrelation, heteroskedasticity, and bias in some explanatory variables. In contrast, dynamic estimators such as GMM offer more reliable estimates by addressing these issues. Additionally, the reasons for the popularity of the Generalized Method of Moments include:

1. The possibility of using lagged variables as appropriate instruments to control for endogeneity.
2. The ability to incorporate the dynamic nature of the dependent variable and the influence of prior periods.
3. Its applicability to time-series, cross-sectional, and panel data estimation.

In general, the algebraic representation of the Generalized Method of Moments is expressed as the dynamic model in equation (3):

Equation (3)

$$Y_{it} = \alpha Y_{(it-1)} + \beta' X_{it} + \mu_i + \emptyset_t + \varepsilon_{it}$$

Here, Y_{it} is the dependent variable, X_{it} is the vector of explanatory variables, μ_i represents the individual fixed effects, $\emptyset_t$ denotes time fixed effects, ε_{it} is the error term, and *i* and *t* indicate the cross-sectional unit and time period, respectively. The GMM estimator is defined as shown in equation (4):

Equation (4)

[Definition omitted in source – assumed to refer to the system or difference GMM estimator]

After estimating the coefficients, it is necessary to conduct the Sargan test to evaluate the validity of the instrumental variables specified in the model and to assess the over-identification of the equation. In addition, the order of autocorrelation of the error terms must be tested, since the use of first-differencing to eliminate fixed effects is appropriate only if the error terms do not exhibit second-order autocorrelation.

3. Findings and Results

Given the main objective of the present research, the estimation of the dynamic model introduced in the methodology section was conducted using the Generalized Method of Moments (GMM) dynamic panel regression approach. Accordingly, the first step is to ensure the stationarity of the variables. For this purpose, the present study employed the Im-Pesaran-Shin (IPS) unit root test for panel data. The results of this test are reported in Table 1. As observed, given the rejection of the null hypothesis suggesting the presence of a unit root, it can be concluded that all variables are stationary at level. Therefore, the unit root issue is not present.

Table 1. Results of Unit Root Test for Variables

Variable Name	Variable Symbol	Statistic	p-value
Bank Profitability	P_it	-2.1252	0.0168
Trade Openness	OP_it	-1.6574	0.0487
Economic Growth	GDP_it	-6.0782	0.0000
Government Expenditure	GOV_it	-4.5042	0.0000
Inflation Rate	INF_it	-1.4931	0.0677
Monetary Policy (Money Supply Growth)	MP_it	-2.9365	0.0017
Credit Risk (NPL Ratio)	CR_it	-4.6982	0.0000

After confirming the absence of a unit root, the panel data convergence test was conducted using the Pedroni cointegration test. Subsequently, tests related to the GMM approach were carried out. The results of the Pedroni cointegration test are presented in Table 2. Given the rejection of the null hypothesis of no cointegration, the existence of convergence is confirmed.

Table 2. Results of the Pedroni Cointegration Test

Test Statistic	Value	p-value
Modified Phillips-Perron t	8.8310	0.0000
Phillips-Perron t	-4.1950	0.0000
Augmented Phillips-Perron t	-3.8659	0.0001

The results of the Sargan test and the Arellano-Bond autocorrelation test to evaluate the validity of the employed method are shown in Tables 3 and 4. Given the non-rejection of the null hypothesis in the Sargan test, the validity of the instrumental variables is confirmed. Moreover, Table 4 shows that the null hypothesis of no second-order serial correlation of the residuals is not rejected. Thus, the estimated dynamic model is valid.

Table 3. Sargan Test for Over-Identification

Test Statistic	p-value
19.78396	1.0000

Table 4. Arellano-Bond Serial Correlation Test

Order	Test Statistic	p-value
First	-2.0023	0.0452
Second	0.3609	0.7182

After confirming the absence of unit roots and validating the model, the model estimation was conducted. The results of the estimation of the Islamic bank profitability model using the GMM approach are presented in Table 5.

Table 5. Estimation Results of Islamic Bank Profitability Model Using GMM

Variable Name	Variable Symbol	Coefficient	Std. Error	t-Statistic	p-value
Lagged Bank Profitability	P_(it−1)	0.73463	0.0414	17.70	0.0000
Trade Openness	OP_it	0.02218	0.0024	9.13	0.0000
Economic Growth	GDP_it	0.00450	0.0011	3.93	0.0000
Government Expenditure	GOV_it	-0.01019	0.0028	-3.53	0.0000
Inflation Rate	INF_it	-0.00003	0.0000	-4.62	0.0000
Monetary Policy (Money Supply Growth)	MP_it	0.01210	0.0033	3.56	0.0000
Credit Risk (NPL Ratio)	CR_it	-0.10470	0.0625	-1.67	0.0940
Interaction of Credit Risk and Monetary Policy	MPCR_it	-0.05514	0.0176	-3.13	0.0020
Constant	CONS	1.76404	0.8719	2.02	0.0430
Wald Statistic (Model Significance)	Wald	—	—	6134.03	0.0000

4. Discussion and Conclusion

Today, the financial sector has become one of the most vital components of the economy, with its stability playing a decisive role in promoting economic growth and achieving macroeconomic stability. Accordingly, in recent years, economic policymakers have pursued policies aimed at fostering stable financial markets. Among these efforts, improving the performance of banks—as the most important financial intermediaries—can significantly influence a country's economic development. Thus, examining the effects of various variables on bank profitability is a prerequisite for making informed policy decisions in this area. It is worth noting that Islamic banks, due to restrictions arising from the prohibition of *riba* (usury) and interest, may respond differently to macroeconomic variables. Therefore, given the importance of bank profitability on one hand, and the distinct structure of Islamic banks due to the prohibition of interest on the other, the fundamental aim of this study was to assess the role of macroeconomic variables—especially monetary policies—on the profitability of Islamic banks in 24 countries during the period from 2013 to 2024, with an emphasis on credit risk, using the GMM method.

The model estimation results indicate that the variables of inflation rate, credit risk, and economic freedom index have a negative impact, while economic growth, trade openness index, and monetary policy have a positive impact on the performance of Islamic banks. Moreover, the moderating role of credit risk in the effect of monetary policy on bank profitability is statistically significant. Based on the estimated model, it is observed that the lagged value of Islamic bank profitability has a significant positive effect on current profitability. This implies that the better the bank's performance in the previous period, the better it will be in the current period, and vice versa.

This finding is consistent with numerous prior empirical studies [21-23] which emphasize the dynamic nature of bank performance models and confirm the influence of previous-period profitability on current bank outcomes.

The results also indicate that trade openness has a positive and significant effect on Islamic bank profitability. This implies that the more open a country is to international trade, the better its banking performance. This finding aligns with many theoretical and empirical studies [24]. Therefore, it can be concluded that foreign trade, by facilitating the transfer of technology and knowledge, enhances production efficiency and economic growth, thereby contributing to improved performance in Islamic banking.

Economic growth also shows a positive and significant effect on the profitability of Islamic banks. This suggests that increased economic growth in the countries under study has led to higher savings and investment driven by rising income, and a reduction in non-performing loans—factors that have contributed to improved Islamic bank performance. This result is consistent with prior theoretical and empirical studies [12, 14, 16].

According to the model estimation, government expenditure—as a proxy for economic freedom—has a negative and significant impact on Islamic bank profitability. This suggests that in countries with Islamic banking systems, excessive government intervention surpasses the optimal threshold, leading to inefficiencies and rent-seeking behaviors, thereby weakening banking performance. This result is also in line with prior findings [16].

As shown in Table 4, the inflation rate has a negative and significant effect on the profitability of Islamic banks. This finding is consistent with theories proposed by Rahimi & Baghestani (2023) and indicates that as inflation rises, economic agents anticipate a decline in the purchasing power of money and tend to shift their financial resources from bank deposits to assets such as gold, foreign currency, real estate, and vehicles [3]. Accordingly, Islamic banks lack adequate incentive mechanisms to attract deposits during inflationary periods. Additionally, the negative impact of inflation on bank profitability can also be attributed to the unpredictability of inflation. As stated by Atashani et al. (2021), unpredictable inflation prevents banks from adjusting their lending rates, resulting in a faster increase in the costs associated with non-performing loans compared to revenues, ultimately reducing profitability [9]. However, since Islamic banks are not interest-based, this second channel does not apply to them. The relatively small coefficient of this variable can be attributed to this reason. The negative impact of inflation on bank profitability confirms the findings of numerous prior empirical studies [11, 13, 16].

According to Table 5, the monetary policy variable, measured through changes in money supply, has a positive and significant relationship with the profitability of Islamic banks. This implies that expansionary monetary policy enhances bank performance, while contractionary monetary policy reduces the profitability of Islamic banks. This finding supports theories proposed in studies [25] indicating that expansionary monetary policies increase the liquidity available to Islamic banks, thereby improving their lending capacity and profitability. It is important to note that since Islamic banks are not based on interest rates, the negative effects of expansionary monetary policy—such as lower interest rates due to increased bond demand—do not apply to them. The positive impact of monetary policies on bank profitability aligns with numerous empirical studies [6, 10, 12, 13, 16, 23].

As expected, the ratio of non-performing loans—used as a proxy for credit risk—has a negative and significant effect on bank profitability. This effect is significant at the 10% level and indicates that rising credit risk reduces the profitability of Islamic banks. Since loan disbursements in the current period rely on the repayments of loans granted in previous periods in both Islamic and conventional banks, delays in these repayments negatively affect banking performance. This finding is consistent with many previous studies [11, 15, 17-19].

Regarding the moderating role of credit risk in the relationship between monetary policy and bank profitability, the negative and significant coefficient of the interaction term between credit risk and monetary policy indicates that expansionary monetary policy amplifies its effects on bank performance through the adverse impact on credit risk. Therefore, it can be concluded that monetary policy affects bank profitability not only directly but also indirectly through the credit risk channel. This result aligns with prior studies [1, 15].

Overall, based on the findings, it can be concluded that the influence of macroeconomic variables on Islamic banking performance is similar to that on conventional banks. However, in cases where the transmission channel of a variable is interest-based (e.g., inflation rate), the prohibition of interest in Islamic banking renders that channel inapplicable, resulting in the variable having a significant but relatively minor effect compared to findings from conventional banking studies.

Policy Recommendations:

- Given the positive impact of international trade on bank profitability, policymakers can enhance Islamic bank performance by reducing trade barriers such as customs tariffs and revising trade laws and regulations to promote trade, technology transfer, and economic productivity.
- Focusing on economic growth can yield multiple benefits, including improvements in banking systems and enhanced Islamic bank performance.
- Considering the negative impact of government size on Islamic bank performance, effective privatization and reducing government intervention in economic activities in countries with Islamic banking systems can improve bank financial health.
- Banks can mitigate declines in profitability during inflationary periods by implementing strategies to incentivize deposit mobilization. Additionally, accurate inflation forecasting can help lessen its negative effects on the banking sector.
- Banks can reduce credit risk and improve performance by enforcing stricter lending regulations and prioritizing the quality rather than the quantity of loans disbursed.
- Given the positive role of expansionary monetary policy, central banks can adopt such policies during financial crises to support bank profitability.

Authors' Contributions

Authors equally contributed to this article.

Ethical Considerations

All procedures performed in this study were under the ethical standards.

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Conflict of Interest

The authors report no conflict of interest.

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