



Islamic and conventional monetary transmission on MSME financing in Indonesia and Malaysia

Nuraeni Nuraeni¹, Syamsul Hidayat Pasaribu², Mohammad Iqbal Irfany³

^{1,2}Department of Economics, Faculty of Economics and Management, IPB University, Bogor, Indonesia

³Department of Sharia Economics, Faculty of Economics and Management, IPB University, Bogor, Indonesia

Article Info

Article history

Received : 2026-05-23

Revised : 2026-06-21

Accepted : 2026-08-01

Published : 2026-08-12

Keywords:

bank lending channel,
conventional credit, dual
monetary transmission, Islamic
financing, VECM

DOI:

[10.20885/JEKI.vol12.iss2.art8](https://doi.org/10.20885/JEKI.vol12.iss2.art8)

JEL Classification:

E52, E58, G21, O16

Corresponding Author:

Nuraeni

nuraeninuraeni@apps.ipb.ac.id

Author's email:

sh_pasaribu@apps.ipb.ac.id

iqbal.irfany@apps.ipb.ac.id

Paper type:

Research paper

Abstract

Purpose – This study examines the effectiveness of conventional and Islamic monetary policy transmission in promoting MSME financing in Indonesia and Malaysia. It analyzes both financing channels, the contribution of monetary and macroeconomic variables, and their effectiveness across the two banking systems.

Methodology – Quarterly data for Indonesia and Malaysia from 2014Q2 to 2025Q4 were analyzed using a vector error correction model (VECM), complemented by Granger causality, impulse response function (IRF), and forecast error variance decomposition (FEVD). The variables include the policy rate, M2, conventional credit, Islamic financing, investment, and GDP.

Findings – Indonesia relies more on the conventional credit channel, which shows a stable response to monetary and macroeconomic shocks. Malaysia demonstrates more balanced transmission between conventional and Islamic channels, with Islamic financing showing stronger real-sector linkages. Transmission effectiveness has two complementary dimensions: IRF indicates that Indonesia's conventional channel is more effective in response stability, whereas FEVD shows that Islamic financing is more sensitive to monetary shocks. Malaysia exhibits balanced and complementary transmission across both channels.

Implications – Indonesia should strengthen Islamic financing through deeper Islamic money markets, improved monetary instruments, and stronger MSME bank intermediation. Malaysia should maintain the integration of both channels to support inclusive and sustainable MSME financing. The findings are limited to Indonesia and Malaysia and may not be generalizable to other dual banking systems.

Originality – This study introduces a two-dimensional perspective on monetary transmission effectiveness by jointly interpreting IRF and FEVD, demonstrating that response stability and shock contribution provide complementary measures of effectiveness in dual banking systems.

Cite this article:

Nuraeni, N., Pasaribu, S. H., & Irfany, M. I. (2026). Islamic and conventional monetary transmission on MSME financing in Indonesia and Malaysia. *Jurnal Ekonomi & Keuangan Islam*, 12(2), 341-356. <https://doi.org/10.20885/JEKI.vol12.iss2.art8>



Center for Islamic Economics Studies
and Development, Faculty of Business
and Economics, Islamic University of
Indonesia

Introduction

Micro, small, and medium enterprises (MSMEs) are key drivers of economic development in emerging market economies because of their substantial contributions to employment and gross domestic product (GDP) (Siregar et al., 2020). Globally, MSMEs account for more than 90% of all business entities and generate approximately 70% of total employment; however, they continue to

face significant financing constraints, particularly in developing countries (World Bank, 2023). Indonesia and Malaysia provide an appropriate context for examining this issue because both countries operate dual banking systems in which conventional and Islamic banks coexist under their respective central banks. As MSMEs dominate the business structure in both economies, improving access to financing is essential for achieving inclusive and sustainable economic growth.

Despite their important economic role, MSMEs in both countries continue to face structural barriers to formal finance. In Indonesia, MSMEs contribute more than 60% of the GDP and absorb almost all of the national workforce; however, a large proportion still lacks access to bank financing because of collateral constraints, limited credit information, and high financing costs (Majelis Permusyawaratan Rakyat Republik Indonesia, 2024; Bank UMKM, 2025; Fajarihza, 2025). The declining share of MSME credit also indicates that financing growth has not kept pace with the sector's expansion (OECD, 2026). Similar conditions are observed in Malaysia, where MSMEs dominate business establishments but continue to face financing barriers because lending decisions rely heavily on historical credit records, despite the policy initiatives introduced by Bank Negara Malaysia to improve financial access (Ng et al., 2025; Bank Negara Malaysia, 2022). Empirical evidence further shows that collateral limitations, low financial literacy, and banks' risk perceptions reinforce credit rationing practices toward MSMEs (Stiglitz & Weiss, 1981; Beck et al., 2008).

The financing challenge is not unique to Indonesia and Malaysia alone. Approximately 40% of MSMEs in developing countries experience limited access to formal credit, while the financing gap is estimated at US\$5.7 trillion, equivalent to nearly 19% of GDP across emerging markets (World Bank, 2025). These conditions indicate weaknesses in financial inclusion and intermediation (Demirguc-Kunt & Klapper, 2012; Levine, 2004). Within dual banking systems, Islamic finance is expected to improve financing access through profit-sharing principles and project feasibility assessments rather than relying primarily on collateral (Beck et al., 2013).

Monetary policy plays an important role in determining the availability of credit and financing. According to Mishkin (2022), monetary policy influences interest rates, money supply, liquidity, and credit to maintain macroeconomic stability. In bank-based financial systems, monetary policy is transmitted mainly through credit channels (Bernanke & Gertler, 1995). As Indonesia and Malaysia operate dual banking systems, monetary transmission occurs through both conventional and Islamic banking (Manan, 2014). Theoretically, Islamic financing is more closely linked to the real sector through profit-sharing and asset-backed financing, making it less sensitive to policy interest rate changes than conventional lending (Chapra, 2000; Ascarya, 2014). However, empirical findings remain inconclusive, as Islamic financing may also respond to policy rate changes through funding costs and competition with conventional banks (Maharani et al., 2025). Furthermore, inflation, investment, and GDP growth affect financing performance by influencing financing costs and the demand for productive investment (Fikri et al., 2023). Therefore, monetary transmission is shaped by both monetary instruments and macroeconomic conditions (Harjes et al., 2020).

Although the literature on monetary transmission has expanded, several research gaps persist. Previous studies generally focus on a single country or examine conventional and Islamic financing separately. Comparative evidence between Indonesia and Malaysia remains limited, particularly regarding MSME financing in dual banking systems. Moreover, studies integrating both banking systems within a unified framework and evaluating transmission effectiveness using Granger causality, Impulse Response Function (IRF), and Forecast Error Variance Decomposition (FEVD) are scarce.

To address these gaps, this study investigates conventional and Islamic monetary transmission in Indonesia and Malaysia using quarterly data from 2014Q2 to 2025Q4. A Vector Error Correction Model (VECM), complemented by Granger causality, IRF, and FEVD analyses, is employed to examine transmission mechanisms, assess the contribution of monetary and macroeconomic variables, and compare the effectiveness of conventional and Islamic financing channels in supporting MSME financing. The findings are expected to contribute to the literature on dual monetary transmission and provide empirical evidence for developing more effective and inclusive monetary policy.

Literature Review

Monetary policy influences economic activity through changes in policy instruments, liquidity, and financial intermediation. According to [Mishkin \(2022\)](#), central banks use policy rates and money supply to maintain price stability, support sustainable economic growth and preserve financial stability. In Indonesia and Malaysia, monetary policy is implemented through the BI Rate or BI 7-Day Reverse Repo Rate and the Overnight Policy Rate (OPRate), while broad money (M2) reflects banking liquidity and the capacity of financial institutions to extend financing. Therefore, these variables are central to evaluating monetary policy transmission through the banking sector.

Indonesia and Malaysia operate dual monetary systems in which conventional and Islamic banks coexist within a common monetary framework ([Iqbal & Mirakhor, 2011](#)). Conventional banks transmit monetary policy primarily through interest-based lending, whereas Islamic banks rely on profit sharing and asset-backed financing ([Chapra, 2008](#)). Because Islamic banks are more closely linked to real economic activities, monetary policy may affect conventional credit and Islamic financing through different transmission mechanisms ([Ascarya, 2012](#); [Kassim & Majid, 2010](#); [Sukmana & Kassim, 2015](#)).

Within the monetary transmission theory, the credit channel is particularly important in bank-based financial systems. Changes in policy rates influence bank liquidity, credit supply, investment, and ultimately, economic growth ([Bernanke & Gertler, 1995](#); [Mishkin, 2022](#)). An expansionary policy increases liquidity and financing, whereas a contractionary policy reduces credit and investment. In dual banking systems, Islamic financing may respond differently because it is influenced by liquidity conditions and real sector activities rather than interest rates alone ([Muhit et al., 2024](#)).

MSMEs are highly dependent on external financing because they generally face limited collateral and information asymmetry issues. As a result, monetary transmission through the banking sector directly affects investment and productive capacity. Broad money (M2), investment, and GDP represent successive stages of the transmission process, linking monetary policy to real economic outcomes through bank lending ([Mishkin, 2006](#); [Mankiw & Taylor, 2020](#)). Therefore, these variables provide a comprehensive framework for evaluating the effectiveness of conventional and Islamic monetary transmission in supporting MSME financing.

Although previous studies have examined monetary transmission in conventional and Islamic banks, the empirical findings remain mixed. Recent evidence shows that conventional bank lending generally responds more strongly to policy rate changes, whereas Islamic financing is more closely associated with liquidity and real sector conditions ([Hasan, 2026](#); [Pamungkas et al., 2025](#)). However, comparative evidence integrating banking systems, monetary variables, and MSME financing across Indonesia and Malaysia remains limited. This study addresses this gap by examining the effectiveness of conventional and Islamic monetary transmission using the unified VECM framework.

Hypotheses development

Monetary policy influences bank lending through changes in the policy rates and banking liquidity. According to the bank lending channel theory, contractionary monetary policy reduces bank liquidity and credit supply, whereas expansionary policy increases lending to the productive sector ([Bernanke & Gertler, 1995](#); [Mishkin, 2009](#)). In dual banking systems, conventional banks are generally more responsive to policy rate changes because lending decisions are directly linked to the interest rates. In contrast, Islamic banks rely on profit sharing and asset-backed financing, making Islamic financing relatively less sensitive to interest rate movements and more dependent on liquidity and real sector activities ([Chapra, 2008](#); [Ascarya, 2012](#)). Recent empirical studies have also reported stronger monetary policy responses to conventional lending than to Islamic financing ([Ilhamdi et al., 2024](#); [Hasan, 2026](#); [Widarjono & Rafik, 2023](#)). Therefore, the following hypotheses are proposed:

- H_{1a}: Monetary policy instruments (BI Rate in Indonesia and OPRate in Malaysia) have a significant dynamic relationship with conventional MSME credit.
- H_{1b}: Monetary policy instruments have a significant dynamic relationship with Islamic MSME financing, but the response is weaker than that of conventional MSME credit.

In addition to policy rates, monetary transmission is influenced by banking liquidity. Within the bank lending channel, changes in broad money (M2) affect banks' capacity to extend financing, while investment and economic growth reflect the transmission of monetary policy to the real sector (Mishkin, 2009; Mankiw & Taylor, 2020). Previous studies suggest that conventional lending is more closely associated with policy rate shocks, whereas Islamic financing is more strongly influenced by liquidity conditions (Zhong et al., 2024; Mubarak & Rusdianto, 2023; Boukhatem & Djelassi, 2022). Accordingly, the following hypotheses were formulated.

H_{2a}: Variations in conventional MSME credit are explained more by monetary policy shocks than by liquidity, investment, and economic growth.

H_{2b}: Variations in Islamic MSME financing are explained more by liquidity (M2) shocks than by policy rate shocks.

Although Indonesia and Malaysia both operate dual banking systems, differences in their financial structures and the development of Islamic banking may lead to different monetary transmission outcomes. Previous comparative studies indicate that the responses of conventional and Islamic banks vary across countries because of differences in financial market characteristics and banking structures (Caporale et al., 2020; Drissi & Guerguer, 2023; Salim et al., 2024). Therefore, this study proposes the following hypothesis:

H₃: The effectiveness of dual monetary policy transmission through conventional and Islamic financing channels differs between Indonesia and Malaysia.

Research Methods

Data and variable definition

This study employed a quantitative approach using quarterly time-series data from the second quarter of 2014 to the fourth quarter of 2025 for Indonesia and Malaysia. These countries were selected because they operate a dual banking system in which conventional and Islamic banking coexist under a dual monetary framework. Secondary data were obtained from official sources, including Bank Indonesia (BI), the Financial Services Authority (Otoritas Jasa Keuangan, OJK), Bank Negara Malaysia (BNM), the World Bank, and the China Economic Information Center (CEIC).

The analysis examines the effectiveness of dual monetary policy transmission through conventional credit and Islamic financing in supporting MSME financing. Monetary policy instruments were represented by the BI Rate for Indonesia and the Overnight Policy Rate (OPRate) for Malaysia. Broad money (M2), investment, and gross domestic product (GDP) were included to capture liquidity conditions, real sector activity, and economic growth. MSME credit and Islamic financing represent conventional and Islamic bank lending channels, respectively.

Econometric approach

The study employed a vector error correction model (VECM) to analyze the dynamic relationships among monetary policy, liquidity, investment, economic growth, conventional credit, and Islamic financing. The VECM framework was selected because it is appropriate for variables that are stationary at the first difference and cointegrated, allowing both short-run dynamics and long-run equilibrium relationships to be estimated simultaneously (Johansen, 1988; Enders, 2015). In addition, all variables were treated as endogenous because monetary policy transmission occurs through the interactions among monetary instruments, banking activities, and the real sector.

To evaluate the dynamic effects of monetary policy shocks, the analysis also employs the Impulse Response Function (IRF) and Forecast Error Variance Decomposition (FEVD). These techniques were used to examine the responses of endogenous variables to policy shocks and to identify the relative contribution of each variable in explaining the forecast error variance (Sims, 1980).

Model specification

Empirical models were developed based on the bank lending channel framework, which assumes that monetary policy influences MSME financing through changes in liquidity, investment, and economic activity. Two separate VECM models were estimated to distinguish the monetary transmission mechanisms in Indonesia and Malaysia.

For Indonesia, the empirical relationship is expressed as

$$Y_t = f(LNGDP_t, LNINV_t, LNFIN_t, LNCRD_t, LNM2_t, BIRate_t)$$

where BIRate represents the Bank Indonesia policy rate.

For Malaysia, the empirical relationship is expressed as

$$Y_t = f(LNGDP_t, LNINV_t, LNFIN_t, LNCRD_t, LNM2_t, OPRate_t)$$

where OPRate denotes the Overnight Policy Rate determined by Bank Negara Malaysia.

Because the variables were integrated and cointegrated, both models were estimated using the following general VECM specification in Equation 1 (Johansen, 1988):

$$\Delta Y_t = \alpha + \Pi Y_{t-1} + \sum_{i=1}^{k-1} \Gamma_i \Delta Y_{t-i} + \varepsilon_t \quad (1)$$

where Y_t is the vector of endogenous variables, α is the intercept vector, Π denotes the long-run cointegration matrix, Γ_i captures the short-run adjustment dynamics, k is the optimal lag length, and ε_t is the white noise error term. Estimating the two models separately enables a direct comparison of monetary policy transmission through conventional and Islamic banking channels in Indonesia and Malaysia.

Estimation procedure

The empirical analysis was conducted in several sequential stages. First, stationarity was examined using the Augmented Dickey-Fuller (ADF) unit root test to determine the order of integration and avoid spurious regression results. Second, the optimal lag length was selected using the Akaike information criterion (AIC), where the specification with the lowest AIC value was chosen (Ekananda, 2015). Third, the Johansen cointegration test was performed to examine the existence of long-run equilibrium relationships among the variables. Evidence of cointegration justified the estimation of the VECM rather than the standard VAR model (Johansen, 1988).

After confirming cointegration, Granger causality tests were conducted to identify the direction of causal relationships among policy rates, M2, investment, GDP, MSME credit, and Islamic financing (Granger, 1969). The stability of the estimated model was evaluated using the modulus of the characteristic roots. The model was considered stable when all roots were located inside the unit circle, providing a valid basis for the dynamic analyses (Enders, 2015).

Impulse response function

The impulse response function (IRF) was employed to trace the dynamic responses of MSME credit and Islamic financing to shocks in monetary policy, M2, investment, and GDP over successive periods. The analysis identified the direction, magnitude, persistence, and adjustment pattern of each response until the variables converged toward their long-run equilibrium (Sims, 1980; Enders, 2015).

Forecast error variance decomposition

Forecast error variance decomposition (FEVD) was employed to measure the relative contribution of shocks in monetary policy, M2, investment, and GDP to the forecast error variance of MSME credit, and Islamic financing. By decomposing forecast uncertainty across different time horizons, the FEVD identifies the variables that contribute most to fluctuations in MSME financing

dynamics and complements the IRF analysis in evaluating the effectiveness of dual monetary policy transmission in Indonesia and Malaysia.

Results and Discussion

Preliminary diagnostic tests

Prior to estimating the vector error correction model (VECM), several preliminary diagnostic tests were conducted to ensure that the data satisfied the econometric assumptions required for dynamic time-series analysis. These tests include the Augmented Dickey-Fuller (ADF) stationarity test, optimal lag selection, VAR stability test, and Johansen cointegration tests. A summary of the diagnostic results for Indonesia and Malaysia is presented in [Table 1](#).

Table 1. Summary of preliminary diagnostic tests

Diagnostic Test	Indonesia	Malaysia	Conclusion
Stationarity (ADF Test)	All variables are non-stationary at level and become stationary after first differencing	Same result	All variables are integrated of order one, I(1)
Optimal Lag (AIC)	Lag 3	Lag 3	Lag 3 selected for both models
VAR Stability	All modulus values < 1 (0.29960-0.96270)	All modulus values < 1 (0.13264-0.94464)	Both VAR models are stable
Johansen Cointegration	Two cointegrating vectors	Three cointegrating vectors	Long-run relationship exists

Source: Processed data.

The ADF test indicates that all variables are non-stationary at the level but become stationary after first differencing, confirming that they are integrated of order one, I(1). This common order of integration satisfies the prerequisite for Johansen cointegration testing and supports the application of the VECM framework ([Dickey and Fuller 1981](#); [Johansen 1988](#)).

The optimal lag selection based on the Akaike Information Criterion (AIC) identifies lag 3 for both Indonesia and Malaysia, indicating that the dynamic interactions among monetary policy, liquidity, financing, investment, and economic growth are best captured using a three-period lag structure. This specification balances the model fit and parsimony while reducing the possibility of residual autocorrelation ([Lütkepohl 2005](#)).

The VAR stability test further confirms that all the characteristic roots lie inside the unit circle. The modulus values ranged from 0.29960 to 0.96270 for Indonesia and from 0.13264 to 0.94464 for Malaysia, indicating that both systems were dynamically stable. Consequently, shocks affecting the variables gradually converge toward equilibrium, allowing subsequent impulse response and variance decomposition analyses to be interpreted reliably ([Enders 2015](#)).

The Johansen cointegration test identified two cointegrating vectors for Indonesia and three for Malaysia, indicating the existence of stable long-run equilibrium relationships among the variables. The presence of cointegration justifies the use of the VECM framework because it simultaneously captures long-run equilibrium and short-run dynamic adjustments among monetary policy, banking intermediation, investment, and economic growth ([Johansen 1988](#); [Enders 2015](#)).

Granger causality results

The Granger causality test was conducted to examine the effectiveness of the bank lending channel in transmitting monetary policy through conventional credit and Islamic financing in Indonesia and Malaysia. The discussion focuses on the principal transmission mechanism linking policy rates, liquidity, financing, investment, and economic growth. The main findings are presented in [Table 2](#).

The Indonesian results indicate that the bank lending channel operates only partially in Indonesia. The transmission from the policy rate to liquidity is not statistically significant, and liquidity does not significantly affect conventional MSME credit. However, liquidity significantly

influences Islamic financing, whereas conventional credit significantly affects investment. Since investment does not significantly influence economic growth, the transmission mechanism is not fully transmitted to the real sector. These findings suggest that monetary transmission in Indonesia follows a partial rather than a complete bank-lending channel.

Table 2. Summary of Granger causality results according bank lending channel theory

Transmission Stage	Indonesia		Malaysia	
	Prob.	Remarks	Prob.	Remarks
BIRATE → LNM2	0,4240	Not significant	0,0231	Significant
LNM2 → LNCRD	0,4528	Not significant	0,8839	Not significant
LNM2 → LNFIN	0,0010	Significant	0,3735	Not significant
LNCRD → LNINV	0,0349	Significant	0,1231	Not significant
LNFIN → LNINV	0,2462	Not significant	0,1095	Not significant
LNINV → LNGDP	0,7138	Not significant	0,9943	Not significant

Note. BIRATE= BI Rate; Bank Indonesia policy rate; M2= broad money; CRD=MSME credit; FIN= finance; INV= investment; GDP=gross domestic product

Source: Processed data.

Malaysia exhibits a different transmission pattern. The policy rate significantly affects liquidity, confirming that the initial stage of monetary transmission operates as predicted by the bank lending channel. However, liquidity does not significantly influence either conventional credit or Islamic financing, and neither financing channel significantly affects investment. Investment also fails to exert a significant influence on economic growth, indicating that the conventional transmission chain weakens after the liquidity stage.

Table 3. Supplementary Granger causality results for Indonesia

Causal Relationship	Prob.	Remarks
BIRATE → LNCRD	0.0050	Significant
LNCRD → BIRATE	0.0239	Significant
LNM2 → LNFIN	0.0010	Significant
LNCRD → LNINV	0.0349	Significant
LNCRD → LNFIN	0.0000	Significant
LNINV → LNFIN	0.0299	Significant
LNGDP → LNCRD	0.0429	Significant
LNGDP → LNFIN	0.0001	Significant
LNFIN → LNGDP	0.0026	Significant
LNGDP → LNINV	0.0056	Significant

Source: Processed data.

The additional Granger causality results in [Table 3](#) reveal several feedback relationships outside the main transmission path. Bidirectional causality exists between Islamic financing and economic growth, whereas conventional credit exhibits significant relationships with the policy rate and liquidity. Economic growth also significantly influences liquidity, conventional credit, investment, and Islamic financing. These interactions indicate that monetary transmission is characterized by endogenous feedback between the financial and real sectors rather than a strictly linear process.

Table 4. Supplementary Granger causality results for Malaysia

Causal Relationship	Prob.	Remarks
OPRATE → LNM2	0.0231	Significant
OPRATE → LNCRD	0.0218	Significant
LNCRD → LNGDP	0.0011	Significant
LNFIN → LNGDP	0.0050	Significant
LNGDP → LNM2	0.0077	Significant

Source: Processed data.

The additional causality analysis for Malaysia in Table 4 shows that both conventional credit and Islamic financing significantly affect economic growth, whereas economic growth significantly influences liquidity. Furthermore, the policy rate directly affects conventional credit but has no statistically significant relationship with Islamic finance. These findings imply that monetary transmission in Malaysia relies more on direct interactions between banking intermediation and the real sector than on the sequential bank-lending channel.

Overall, the Granger causality results demonstrate that monetary transmission remains incomplete in both the countries. Indonesia exhibits stronger evidence of transmission through liquidity to Islamic financing and from conventional credit to investment, whereas Malaysia shows a more balanced interaction between conventional and Islamic banking, with both financing channels contributing directly to economic activity despite the incomplete operation of the conventional bank lending channel.

Impulse response function (IRF)

The Impulse Response Function (IRF) analysis was employed to examine the dynamic responses of MSME credit and financing to shocks in the policy rate, money supply (M2), investment, and economic growth. IRF illustrates both the direction and persistence of responses following an exogenous shock, thereby providing evidence of the effectiveness of the monetary transmission mechanism (Enders 2015; Lütkepohl 2005). The results for Indonesia and Malaysia are presented in Figures 1,2,3 and 4.

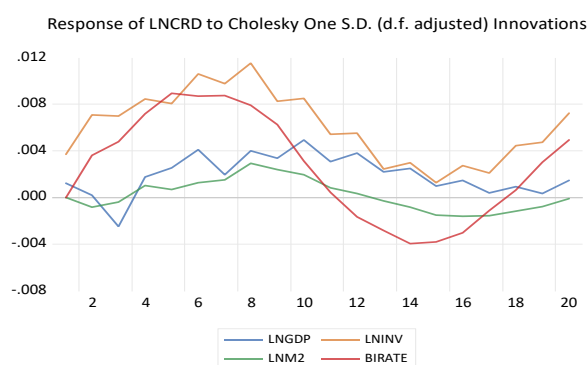


Figure 1. Response of conventional MSME credit to shocks in BI Rate, M2, investment, and GDP (Indonesia)

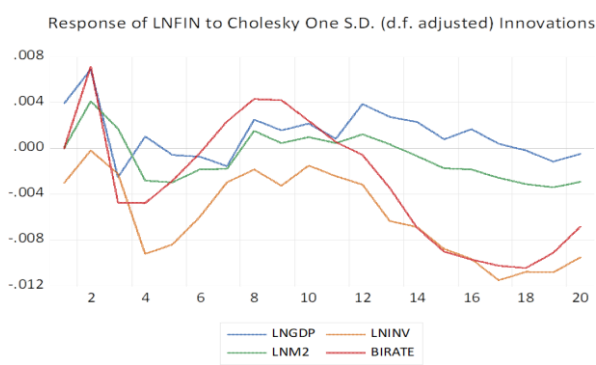


Figure 2. Response of Islamic MSME financing to shocks in BI Rate, M2, investment, and GDP (Indonesia)

The IRF results indicate distinct adjustment patterns between conventional MSME credit and Islamic MSME financing in Indonesia. Conventional credit exhibits relatively stable responses to macroeconomic shocks. GDP and investment shocks generate positive responses throughout the forecast horizon, reaching 0.00145 and 0.00723, respectively, in period 20. In contrast, the response to M2 remains marginal and turns slightly negative at -0.00010, while the response to the BI Rate increases from zero to 0.00493. The persistent positive responses to GDP and investment suggest that conventional MSME credit is closely associated with economic activity and investment demand, while the relatively weak response to M2 indicates that additional liquidity does not automatically translate into greater MSME lending.

Islamic MSME financing displayed a less stable adjustment pattern. Although the initial response to GDP is positive (0.00392), it becomes negative at -0.00047 in period 20. Investment, M2, and BI Rate shocks also generate increasingly negative responses, reaching -0.00954, -0.00291, and -0.00686, respectively. This pattern indicates that Islamic financing is more sensitive to changes in macroeconomic and monetary conditions than conventional credit financing. A stronger adjustment may reflect the smaller scale and evolving intermediation capacity of Islamic banking in Indonesia. As argued by Aysan et al. (2022), differences in financial depth and intermediation structures can produce different adjustment mechanisms between conventional and Islamic banks.

Overall, the Indonesian IRF results suggest that the conventional credit channel provides more stable adjustment dynamics, whereas the Islamic financing channel exhibits greater sensitivity and fluctuations in response to monetary and macroeconomic shocks. This finding indicates that the distinction between the two channels lies not only in the direction of the responses but also in their stability and persistence.

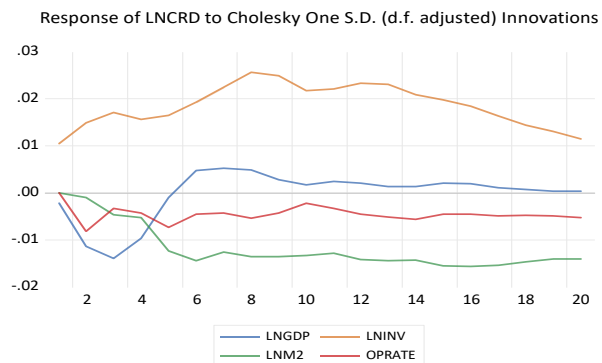


Figure 3. Response of conventional MSME credit to shocks in OPRate, M2, investment, and GDP (Malaysia)

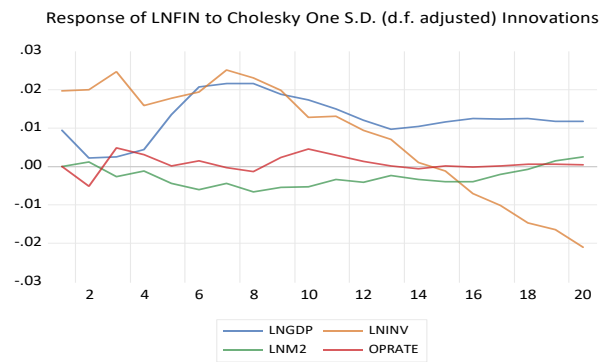


Figure 4. Response of Islamic MSME financing to shocks in OPRate, M2, investment, and GDP (Malaysia)

The Malaysian IRF results reveal a more differentiated and complementary transmission pattern. Conventional MSME credit initially responds negatively to GDP shocks, reaching -0.01390 in period 3, before recovering to 0.00039 in period 20 and remaining stable thereafter. In contrast, investment generates a persistent positive response, from 0.01054 in period 1 to 0.01145 in period 20. The response to OPRate remains negative, from -0.00821 in period 2 to -0.00522 in period 20, consistent with the conventional interest rate and bank lending channels. Meanwhile, the M2 response becomes negative, reaching -0.01413 at the end of the horizon. These results indicate that conventional credit in Malaysia remains responsive to monetary conditions, particularly policy rate shocks, while investment provides a persistent link to economic activity.

Islamic financing is more strongly associated with real sector conditions. Its response to GDP remains positive throughout the horizon, increasing from 0.00944 in period 1 to 0.01170 in period 20. Investment initially produces a positive response of 0.01970, reaching 0.02511 in period 7, but subsequently turns negative and reaches -0.02094 in period 20. The responses to M2 and OPRate fluctuated comparatively, ending at 0.00252 and 0.00045, respectively. The persistent positive response to GDP indicates a closer link between Islamic financing and real economic activity, consistent with the asset-backed and transaction-based characteristics of Islamic finance.

These findings are consistent with [Caporale et al. \(2020\)](#), who demonstrate that conventional and Islamic banking channels respond differently to monetary conditions because of differences in financing contracts and intermediation structures. [Rashid et al. \(2020\)](#) likewise show that monetary policy transmission in Malaysia operates through both conventional and Islamic banking, while [Hunjra et al. \(2022\)](#) emphasize the two banking systems' complementary role in financial intermediation.

Overall, the Malaysian IRF results indicate that conventional credit exhibits a relatively more stable transmission through the policy rate channel, whereas Islamic financing demonstrates a stronger and more persistent connection with real sector activity, particularly GDP. Thus, the findings point to complementary transmission functions rather than the superiority of one channel over another.

Forecast error variance decomposition (FEVD)

Forecast error variance decomposition (FEVD) was employed to measure the contribution of each shock to the variability of MSME credit and financing over different horizons. Unlike the IRF, which illustrates the dynamic response to individual shocks, the FEVD identifies the relative importance of each variable in explaining the forecast error variance, thereby providing additional

evidence regarding the effectiveness of the monetary transmission mechanism (Enders 2015). The FEVD results for Indonesia and Malaysia are presented in Figures 5,6,7 and 8.

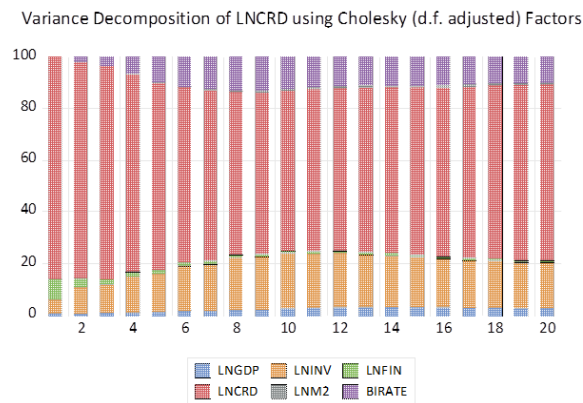


Figure 5. FEVD of conventional MSME credit in Indonesia

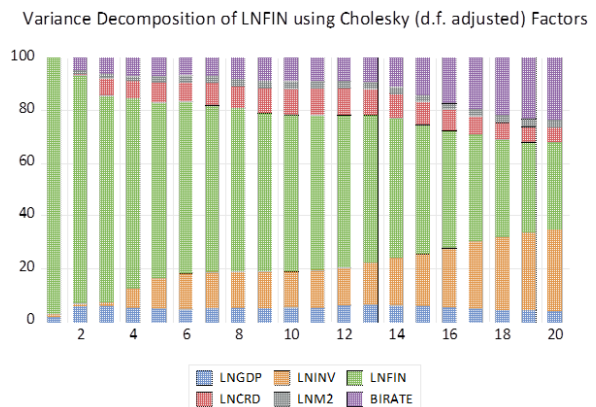


Figure 6. FEVD of Islamic MSME financing in Indonesia

The FEVD results further clarify the relative importance of shocks in explaining MSME financing dynamics in Indonesia. Conventional credit is predominantly explained by its own innovations, although this contribution declines from 86.15% in period 1 to 67.95% in period 20. Among external factors, investment is the largest contributor, reaching 17.87%, followed by the BI Rate at 10.08% in period 20. The relatively large contribution of own shocks indicates that conventional MSME credit has strong internal persistence, while the increasing contribution of investment highlights the importance of real sector activity in determining credit dynamics.

The pattern differs substantially for Islamic financing methods. Its own contribution falls from 97.41% to 32.80%, while investment becomes the largest external contributor, reaching 31.06% in Period 20. The contribution of the BI Rate also increases markedly to 23.60%, exceeding its contribution to conventional credit. GDP and M2 contributed 3.88% and 2.97%, respectively. These results indicate that Islamic financing is increasingly influenced by external macroeconomic and monetary shocks over longer horizons. The relatively large contribution of the BI Rate does not imply that Islamic banks operate through an interest-based mechanism; rather, it reflects the integration of Islamic banking with the broader monetary and financial environment. This interpretation is consistent with Yusof and Majid (2022), who explain that changes in policy rates can affect Islamic financing through funding costs, expected returns, and depositor behavior.

Therefore, the FEVD results complement the IRF findings. While the IRF indicates that conventional credit has more stable adjustment dynamics, the FEVD shows that Islamic financing is relatively more sensitive to external monetary shocks. Investment is also an important determinant of both channels, supporting the view that MSME financing remains closely connected to real sector activity (Audah & Kasri, 2020; Ramly et al., 2025).

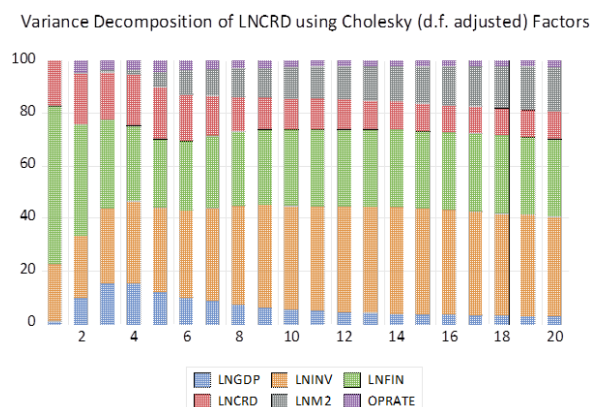


Figure 7. FEVD of conventional MSME credit in Malaysia

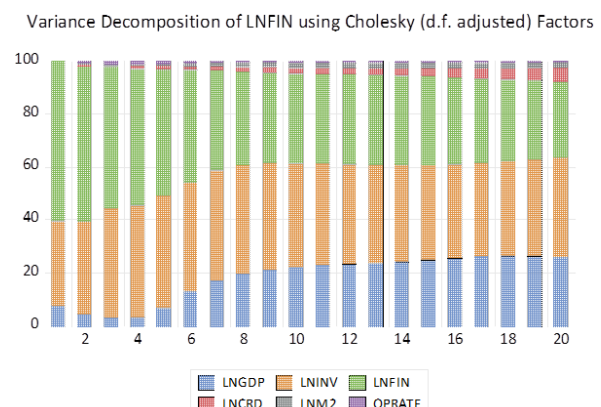


Figure 8. FEVD of Islamic MSME financing in Malaysia

The FEVD results for Malaysia demonstrate a more integrated financing dynamics structure. For conventional MSME credit, the contribution of its own shocks declines from 17.22% in period 1 to 10.42% in period 20. Investment becomes the largest contributor, increasing from 21.53% to 37.82%, followed by Islamic financing at 29.75% and M2 at 16.79% in period 20. In comparison, the contribution of OPRate remained limited at 2.46%. This indicates that conventional credit dynamics are increasingly explained by investment, liquidity, and interactions with the Islamic financing channel, rather than by direct policy rate shocks alone.

A similar pattern emerges for Islamic financing as well. Its own contribution decreases from 60.30% to 28.57%, while investment remains the largest contributor, increasing from 32.28% to 37.54%. GDP also becomes increasingly important, rising from 7.42% to 25.91%, indicating a strong relationship between Islamic financing and real sector activity. In contrast, the contributions of M2 and OPRate remain relatively small at 1.90% and 0.70%, respectively, in period 20.

The Malaysian FEVD results indicate that investment is the dominant external factor explaining variations in both financing channels, whereas GDP is particularly important for Islamic financing. The relatively limited contribution of OPRate suggests that direct policy rate shocks explain only a small proportion of financing variability over the longer horizon. This finding is consistent with Caporale et al. (2020), who highlighted the differences in the transmission mechanisms of conventional and Islamic banking, and with Rashid et al. (2020), who demonstrated that both banking systems participate in monetary transmission in Malaysia.

Taken together with the IRF results, the FEVD evidence suggests that Malaysia has a more complementary dual banking transmission structure than Indonesia. Conventional credit remains relatively responsive to the policy rate channel, whereas Islamic financing is more strongly connected to real sector developments. Therefore, the two channels appear to perform differentiated but mutually reinforcing roles within Malaysia's dual banking system.

Comparison of Granger causality, IRF, and FEVD results

The three analytical approaches provide a consistent assessment of monetary transmission in both countries, although they emphasize different aspects of the transmission process. The comparisons are summarized in [Table 5](#).

Table 5. Comparison of monetary transmission effectiveness in Indonesia and Malaysia

Analysis	Indonesia	Malaysia
Granger Causality	Conventional channel is more dominant	Both channels are relatively balanced
IRF	Conventional channel exhibits more stable responses	Islamic channel is more responsive to the real sector
FEVD	Islamic channel is more sensitive to monetary policy shocks	Both channels are relatively balanced with stronger integration

Overall, Indonesia continues to exhibit the dominance of the conventional credit channel in transmitting monetary policy to the MSME sector, and Granger causality identifies stronger transmission through conventional credit, whereas the IRF demonstrates more stable responses of conventional lending to macroeconomic shocks. Nevertheless, FEVD indicates that Islamic financing is relatively more sensitive to monetary policy shocks, reflecting the growing role of Islamic banking following recent industry consolidation ([Karuni & Sunaryati 2024](#)).

Malaysia has a more balanced transmission structure. Granger causality suggests that conventional and Islamic financing play complementary roles, IRF shows that Islamic financing responds more strongly to real economic activity, and FEVD indicates only a slight advantage of the conventional credit channel in transmitting policy rate shocks. These findings reflect the more advanced development of Malaysia's dual banking system, where Islamic banks possess substantially greater intermediation capacity than in Indonesia, while conventional banks continue to serve as the primary channel for transmitting policy rate changes ([Rashid et al. 2020](#)).

Overall, the comparative evidence indicates that monetary transmission is shaped not only by policy rate adjustments but also by the structure and maturity of the financial system. Indonesia is characterized by the predominance of conventional banking, whereas Malaysia exhibits a more integrated dual banking system in which conventional and Islamic institutions jointly contribute to monetary transmission and MSME financing.

Conclusion

This study examined the effectiveness of dual monetary transmission channels through conventional credit and Islamic financing in supporting MSME financing in Indonesia and Malaysia. The findings reveal that the two countries exhibit different transmission mechanisms between the two variables. In Indonesia, monetary transmission is more dominant through the conventional credit channel, which shows stronger causality relationships and more stable responses to monetary and macroeconomic shocks than in other countries. Meanwhile, Islamic financing also contributes to the transmission mechanism but demonstrates relatively more fluctuating responses. In contrast, Malaysia shows a more balanced transmission mechanism between conventional and Islamic channels, where Islamic financing has stronger linkages with real sector activities, and conventional credit continues to transmit monetary policy through the credit channel.

The contribution of monetary policy instruments, money supply, and macroeconomic variables in explaining MSME financing variations differs from country to country. In Indonesia, investment is the largest external factor explaining variations in both conventional credit and Islamic financing. However, the contribution of the BI Rate to Islamic financing is greater than that to conventional credit, indicating the higher sensitivity of Islamic financing to monetary policy changes. In Malaysia, both financing channels are influenced more evenly by monetary instruments, money supply, and macroeconomic conditions, reflecting a more integrated dual banking system than in Indonesia.

These findings indicate that the effectiveness of dual monetary transmission in supporting MSME financing depends on the characteristics and development of each banking system's characteristics and development. Indonesia remains more reliant on the conventional credit channel due to its greater stability in responding to economic shocks, while Malaysia demonstrates a more complementary role between the conventional and Islamic financing channels. Therefore, strengthening MSME financing requires policies that improve the effectiveness of both channels, particularly by enhancing Islamic financing capacity and maintaining the integration between conventional and Islamic banking systems.

This study is subject to several limitations, particularly its focus on Indonesia and Malaysia, with selected monetary, financial, and macroeconomic variables. Future research could expand the analysis by including more countries with dual banking systems, bank-level data, sector-specific MSME characteristics, Islamic monetary instruments, financial inclusion indicators, digital financial development and institutional factors. Further studies may also employ alternative econometric approaches, such as time-varying parameter VAR (TVP-VAR), Structural VAR (SVAR), or Panel VAR (PVAR), to capture changes in monetary transmission dynamics under different economic conditions.

Abbreviations

BI: Bank Indonesia

BI Rate: Bank Indonesia Policy Rate

BNM: Bank Negara Malaysia

CEIC: China Economic Information Center

GDP: Gross Domestic Product

IMF: International Monetary Fund

M2: Broad Money

MSMEs: Micro, Small, and Medium Enterprises

OJK: Financial Services Authority (Otoritas Jasa Keuangan)

OPRate: Overnight Policy Rate

Author contributions

Conceptualization: Nuraeni, Syamsul Hidayat Pasaribu, Mohammad Iqbal Irfany

Data curation: Nuraeni, Syamsul Hidayat Pasaribu, Mohammad Iqbal Irfany

Formal analysis: Nuraeni, Syamsul Hidayat Pasaribu, Mohammad Iqbal Irfany

Investigation: Nuraeni

Methodology: Nuraeni, Syamsul Hidayat Pasaribu, Mohammad Iqbal Irfany

Project administration: Nuraeni, Syamsul Hidayat Pasaribu, Mohammad Iqbal Irfany

Supervision: Syamsul Hidayat Pasaribu, Mohammad Iqbal Irfany

Validation: Nuraeni, Syamsul Hidayat Pasaribu, Mohammad Iqbal Irfany

Visualization: Nuraeni

Writing original draft: Nuraeni

Writing review & editing: Nuraeni, Syamsul Hidayat Pasaribu, Mohammad Iqbal Irfany

Funding statement

This research did not receive any specific grants from any funding agency in the public, commercial, or not-for-profit sectors. The study was fully funded by the authors of the study.

Data availability statement

The data supporting the findings of this study are publicly available from official sources, including Bank Indonesia, the Financial Services Authority (OJK), Bank Negara Malaysia, the International Monetary Fund (IMF), the World Bank, and the CEIC. The datasets compiled and analyzed in the current study are available from the corresponding author upon reasonable request.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this manuscript, the authors used ChatGPT solely for language editing to improve English grammar and readability of the text. No AI-generated content was used as scientific evidence or to draw conclusions. All scientific interpretations, analyses, and conclusions were developed and verified by the authors, who take full responsibility for this manuscript's content.

Conflict of interest statement

Ethical approval and informed consent were not required for this study because it was based exclusively on publicly available secondary data obtained from official institutions, including the Bank of Indonesia.

Ethical approval and consent to participate

Ethical approval and informed consent were not required for this study because it was based exclusively on publicly available secondary data obtained from official institutions, including Bank Indonesia, the Financial Services Authority (OJK), Bank Negara Malaysia, the World Bank, the International Monetary Fund (IMF), and the CEIC. This study did not involve the direct participation of human subjects, animals, or identifiable personal information.

Acknowledgements

The authors would like to express their sincere gratitude to IPB University for providing academic support and research facilities for this study. The authors also thank all individuals and institutions who contributed to this research by providing valuable discussions, constructive feedback, and access to the data and information used in this study.

References

- Ascarya. (2012). Transmission channel and effectiveness of dual monetary policy in Indonesia. *Bulletin of Monetary Economics and Banking*, 14(3), 1–30. <https://doi.org/10.21098/bemp.v14i3.405>
- Ascarya. (2014). Monetary policy transmission mechanism under dual financial system in Indonesia: Interest-profit channel. *International Journal of Economics, Management and Accounting*, 22(1), 1–32. <https://doi.org/10.31436/ijema.v22i1.254>

- Audah, M. T., & Kasri, R. A. (2020). Does Islamic banking matter in transmitting monetary policy? Empirical evidence from Indonesia and Malaysia. *Pertanika Journal of Social Sciences and Humanities*, 28(1), 679–694. [http://www.pertanika.upm.edu.my/pjssh/browse/regular-issue?article=JSSH\(S\)-1090-20](http://www.pertanika.upm.edu.my/pjssh/browse/regular-issue?article=JSSH(S)-1090-20)
- Aysan, A. F., Disli, M., Ng, A., & Ozturk, H. (2022). Is the Islamic banking sector resilient to monetary policy shocks? *Pacific-Basin Finance Journal*, 73, 101760. <https://doi.org/10.1016/j.pacfin.2022.101760>
- Bank Negara Malaysia. (2022). *BNM Fund for SMEs*. <https://www.bnm.gov.my/funds4SME>
- Bank UMKM. (2025, Januari 22). *Akselerasi Penguatan UMKM dengan Pembiayaan Modal*. <https://bankumkm.id/akselerasi-penguatan-umkm-dengan-pembiayaan-modal/>
- Beck, T., Demirgüç-Kunt, A., & Maksimovic, V. (2008). Financing patterns around the world: Are small firms different? *Journal of Financial Economics*, 89(3), 467–487. <https://doi.org/10.1016/j.jfineco.2007.10.005>
- Beck, T., Demirgüç-Kunt, A., & Merrouche, O. (2013). Islamic vs. conventional banking: Business model, efficiency and stability. *Journal of Banking & Finance*, 37(2), 433–447. <https://doi.org/10.1016/j.jbankfin.2012.09.016>
- Bernanke, B. S., & Gertler, M. (1995). Inside the black box: The credit channel of monetary policy transmission. *Journal of Economic Perspectives*, 9(4), 27–48. <https://doi.org/10.1257/jep.9.4.27>
- Boukhatem, J., & Djelassi, M. (2022). The bank-lending channel of monetary policy transmission in a dual banking system: Empirical evidence from panel VAR modeling. *Cogent Economics & Finance*, 10(1), 2107765. <https://doi.org/10.1080/23322039.2022.2107765>
- Caporale, G. M., Çatık, A. N., Helmi, M. H., Ali, F. M., & Tajik, M. (2020). The bank lending channel in the Malaysian Islamic and conventional banking system. *Global Finance Journal*, 45, 100478. <https://doi.org/10.1016/j.gfj.2019.100478>
- Chapra, M. U. (2000). *Sistem Moneter Islam* (I. A. Basri, Terj.). Gema Insani.
- Chapra, M. U. (2008). *The Islamic Vision of Development in the Light of Maqasid al-Shariah*. IIIT.
- Demirguc-Kunt, A., & Klapper, L. (2012). Measuring financial inclusion: The global index database. *Policy Research Working Paper*, 31(1), 1–29. <https://doi.org/10.1596/1813-9450-6025>
- Dickey, D. A., & Fuller, W. A. (1981). Likelihood ratio statistics for autoregressive time series with a unit root. *Econometrica: journal of the Econometric Society*, 1057–1072. <https://doi.org/10.2307/1912517>
- Drissi, S., & Guerguer, W. (2023). The effects of interest rates on Islamic and conventional banks: A comparative study of monetary policy transmission channels. *European Journal of Islamic Finance*, 10(3), 28–44. <https://doi.org/10.13135/2421-2172/7389>
- Ekananda, M. (2015). *Ekonometrika dasar untuk penelitian ekonomi, sosial dan Bisnis*. Mitra Wacana Media.
- Enders, W. (2015). *Applied econometric time series* (4th ed.). Wiley.
- Fajarihza, R. F. (2025, Juli 22). Data uang beredar BI: Kredit UMKM masih loyo, segmen mikro susut 2,5%. *Bisnis.com*. <https://finansial.bisnis.com/read/20250722/90/1895347/data-uang-beredar-bi-kredit-umkm-masih-loyo-segmen-mikro-susut-25>
- Fikri, R. J., Sugema, I., & Pasaribu, S. H. (2023). Analisis respon kredit perbankan terhadap kebijakan quantitative easing di masa pandemi Covid-19 di Indonesia. *Jurnal Ekonomi dan Kebijakan Pembangunan*, 12(2), 185–294. <https://doi.org/10.29244/jekp.12.2.2023.185-204>

- Granger, C. W. J. (1969). Investigating causal relations by econometric models and cross spectral methods. *Econometrica*, 37(3), 424–438. <https://doi.org/10.2307/1912791>
- Harjes, T., Sahay, R., & Xue, Y. (2020). Monetary policy transmission in emerging markets and developing economies. *IMF Working Paper*. Monetary and Capital Markets Department. <https://doi.org/10.5089/9781513529738.001>
- Hasan, Z. (2026). Monetary policy transmission to Islamic bank financing in Indonesia: Evidence from a Structural VAR Approach. *Issues and Perspectives in Business and Social Sciences*, *6*(2), 488–505. <https://doi.org/10.33093/ipbss.2026.6.2.18>
- Hunjra, A. I., Islam, F., Verhoeven, P., & Hassan, M. K. (2022). The impact of a dual banking system on macroeconomic efficiency. *Research in International Business and Finance*, *61*, 101647. <https://doi.org/10.1016/j.ribaf.2022.101647>
- Ilhamdi, I., Luqman, L., & Ali, J. K. (2024). Banking model and monetary transmission mechanism in Indonesia: Are Islamic banks more effective? *Asy-Syar'iyah: Jurnal Ilmu Syari'ah dan Perbankan Islam*, *9*(2), 149–166. <https://doi.org/10.32923/asy.v9i2.5074>
- Iqbal, Z., & Mirakhor, A. (2011). *An introduction to Islamic finance: Theory and practice*. Wiley.
- Johansen, S. (1988). Statistical analysis of cointegration vectors. *Journal of Economic Dynamics and Control*, 12(2–3), 231–254. [https://doi.org/10.1016/0165-1889\(88\)90041-3](https://doi.org/10.1016/0165-1889(88)90041-3)
- Karuni, M. S., & Sunaryati, S. (2024). The Dual-Monetary Policy and Growth of the Real Sector (A Study Case in Indonesia and Malaysia). *Global Review of Islamic Economics and Business*, 12(2), 132-156. <https://doi.org/10.14421/grieb.2024.122-05>
- Kassim, S. H., & Majid, M. S. (2010). Impact of financial shocks on Islamic banks: Malaysian evidence during 1997 and 2007 financial crises. *International Journal of Islamic and Middle Eastern Finance and Management*, *3*(4), 291–305. <https://doi.org/10.1108/17538391011093243>
- Levine, R. (2004). *Finance and growth: Theory and evidence* (NBER Working Paper No. 10766). National Bureau of Economic Research. <https://doi.org/10.3386/w10766>
- Lütkepohl, H. (2005). *New Introduction to Multiple Time Series Analysis*. Springer.
- Maharani, A. P., Natazza, J., & Ardana, Y. (2025). Pengaruh inflasi, dan BI rate terhadap pembiayaan bank syariah di Indonesia. *Journal of Artificial Intelligence and Digital Business (RIGSS)*, *4*(2), 340–347. <https://doi.org/10.31004/riggs.v4i2.495>
- Majelis Permusyawaratan Rakyat Republik Indonesia. (2024, Maret 19). *Hubungan yang kuat antara sektor industri dan UMKM harus segera diwujudkan*. <https://www.mpr.go.id/berita/Hubungan-yang-Kuat-antara-Sektor-Industri-dan-UMKM-Harus-segera-Diwujudkan>
- Manan, A. (2017). *Hukum ekonomi syariah: dalam perspektif kewenangan peradilan agama*. Kencana.
- Mankiw, N. G., & Taylor, M. P. (2020). *Economics* (5th ed.). Cengage Learning.
- Mishkin, F. S. (2006). Monetary policy strategy: How did we get here? *National Bureau of Economic Research Working Paper Series*, No. 12515. <https://doi.org/10.3386/w12515>
- Mishkin, F. S. (2022). *The economics of money, banking, and financial markets* (13th ed.). Pearson.
- Mubarok, F., & Rusdianto. (2023). The distribution of profits and losses, as well as monetary policy, in Islamic banks Indonesia. *Jurnal Ekonomi dan Bisnis Islam (JEBIS)*, 9(1), 172–189. <https://doi.org/10.20473/jebis.v9i1.42507>
- Muhit, M., Janwari, Y., & Hakim, S. A. (2024). Dinamika kebijakan moneter studi komparasi antara Indonesia dan Malaysia. *AL-AFKAR: Journal for Islamic Studies*, 7(2), 606–619. <https://doi.org/10.31943/afkarjournal.v7i2.1043>

- Ng, C. C., Low, W. Z., Lim, J. Y., & Boon, Y. Y. (2025, Desember 23). *Cash Flow Underwriting with Bank Transaction Data: Advancing MSME Financial Inclusion in Malaysia*. [Paper presentation atau Laporan]. Kuala Lumpur, Malaysia. <https://cdn.arenafi.org/papers/arxiv/2510.16066v3.pdf>
- OECD. (2026, Maret 31). *Financing SMEs and Entrepreneurs 2026*. https://www.oecd.org/en/publications/financing-smes-and-entrepreneurs-2026_075d8058-en.html
- Pamungkas, P., Septianto, F., Trinugroho, I., & Ab-Rahim, R. (2025). Monetary policy via Bank Lending Channel: Evidence from lending decomposition. *Journal of Risk and Financial Management (JRFM)*, 18(5), 249. <https://doi.org/10.3390/jrfm18050249>
- Ramly, A., Esen, A., & Nurjanah. (2025). A study on the dual transmission mechanism of monetary policy in Indonesia. *AT-Tasyri': Jurnal Ilmiah Prodi Muamalah*, 17(1), 117–130. <https://doi.org/10.47498/tasyri.v17i1.4652>
- Rashid, A., Hassan, M. K., & Shah, M. A. R. (2020). On the role of Islamic and conventional banks in the monetary policy transmission in Malaysia: Do size and liquidity matter? *Research in International Business and Finance*, 52, 101123. <https://doi.org/10.1016/j.ribaf.2019.101123>
- Salim, K., Abojeib, M., Azmi, W., & Alchaar, M. O. (2023). The Bank Lending Channel in dual banking systems: How market power shapes monetary policy effectiveness. *International Journal of Islamic Economics*, 5(2), 91–113. <https://doi.org/10.32332/ijie.v5i02.8057>
- Sims, C. A. (1980). Macroeconomics and reality. *Econometrica: journal of the Econometric Society*, 1–48. <https://doi.org/10.2307/1912017>
- Siregar, H., Ahmad, F. S., Hasanah, H., & Pasaribu, S. H. (2020). El nino and determinants of the output of micro and small industry in Java. *Indonesian Journal of Business and Entrepreneurship*, 6(1). <http://doi.org/10.17358/IJBE.6.1.97>
- Stiglitz, J. E., & Weiss, A. (1981). Credit rationing in markets with imperfect information. *The American Economic Review*, 71(3), 393–410. <https://www.jstor.org/stable/1802787>
- Sukmana, R., & Kassim, S. H. (2010). Roles of the Islamic banks in the monetary transmission process in Malaysia. *International Journal of Islamic and Middle Eastern Finance and Management*, 3(1), 7–19. <https://doi.org/10.1108/17538391011033834>
- Widarjono, A., & Rafik, A. (2023). Do Islamic banks have their benchmarks for financing rates in the dual-banking system? *Cogent Economics & Finance*, 11(1), 2209954. <https://doi.org/10.1080/23322039.2023.2209954>
- World Bank. (2023). *Financing small and medium enterprises*. World Bank Group.
- World Bank. (2025, Oktober 7). *Small and medium enterprises (SMEs) Finance*. <https://www.worldbank.org/en/topic/smefinance>
- Zhong, H., Feng, Z., Wang, Z., & Wang, Y. (2024). Revisiting the monetary transmission mechanism via banking from the perspective of credit creation. *National Accounting Review*, 6(1), 116–147. <https://doi.org/10.3934/NAR.2024006>