

Financial Inclusion, Macroeconomic Conditions, and Their Role in Indonesia's Financial Stability

Rini Dwi Astuti*, Joko Waluyo, Sri Isworo Ediningsih, Keysha Oktavia Rhamadhani

Universitas Pembangunan Nasional Veteran Yogyakarta, Indonesia

Received : September 15,
2025

Revised : September 17,
2025

Accepted : October 1, 2025

Online : October 14, 2025

Abstract

Financial inclusion improves financial stability by strengthening the bank's funding base through savings, encouraging broader credit distribution, especially for SMEs, and reducing the risk of default. By providing access to financial products and services for the public and businesses, financial inclusion creates a more resilient and efficient system that can withstand economic shocks. This study aims to analyze the influence of financial inclusion and macroeconomic conditions on financial stability in Indonesia, from January 2021 to May 2025. During this period, COVID-19 has impacted the ability of businesses to survive amid the crisis. The ARDL dynamic model was chosen to accommodate the economic dynamics during and after the pandemic. The main advantages of ARDL are its ability to analyze both long-run and short-run relationships simultaneously, its capacity to handle variables with varying degrees of integration (including non-stationary ones), and its efficiency in dealing with small data samples. Based on the ARDL model regression results, financial inclusion and price stability have a significant influence on financial stability in Indonesia. Higher credit access and rising inflation can increase the risk of bank bankruptcy by leading to an increase in non-performing loans. Financial inclusion and inflation can impact financial stability through complex mechanisms. Increasing credit access without strong risk management and adequate regulation can increase the risk of non-performing loans, while uncontrolled inflation can exacerbate the situation by affecting borrowers' repayment capacity. However, with the right policies, financial inclusion can ultimately enhance the long-term stability of the financial system.

Keywords *Financial Stability, Financial Inclusion, Macroeconomics, ARDL*

INTRODUCTION

The financial system contributes significantly to an economy because it helps channel funds from those with excess funds to those with insufficient funds (Mishkin, 2019). If the financial system is unstable and functioning poorly, the distribution of funds cannot run smoothly and effectively, which can impact economic progress. According to Syaputra and Adry (2019), financial system stability can be achieved if it is characterized by a stable economy and financial system. An unstable financial system in an economy will directly impact overall economic instability.

Many factors influence financial system stability, one of which is financial inclusion. According to Malik et al. (2022), financial inclusion encompasses all efforts aimed at eliminating all forms of price and non-price barriers to public access to financial services. This aligns with Khan et al.'s (2022) opinion, which states that financial inclusion can lower credit standards as financial institutions attempt to reach the underbanked by lowering loan requirements. It can also increase banks' reputational risk due to the increased availability of financial services in some countries, which lowers the standards for establishing financial institutions in rural areas (Adeabah, 2023). It can also cause instability due to inadequate regulations for microfinance institutions (Barkat et al., 2024). According to Bank Indonesia (2025), the development of digital fintech supports financial system stability while enhancing financial inclusion through more inclusive macroprudential policies. Fintech's presence can increase public interest in banking by simplifying financial transactions. Therefore, with easier access, the number of financial service users is likely to

Copyright Holder:

© Rini, Joko, Sri, & Keysha. (2025)

Corresponding author's email: rinidwiastuti@upnyk.ac.id

This Article is Licensed Under:



increase, thereby accelerating financial inclusion (Astuti & Purwiyanta, 2021; Astuti et al., 2023). This, in turn, can promote financial system stability (Putri et al., 2024).

This study aims to analyze the influence of financial inclusion and macroeconomic stability on financial system stability in Indonesia. This research provides research benefits in the form of developing an effective intervention model to increase financial inclusion, support financial system stability, and mitigate financial risks. The intervention model is based on best practices identified through research and adapted to the Indonesian regional context. Furthermore, this research is expected to increase public and policymakers' awareness and understanding of the importance of financial inclusion and access to financial services, resulting in improved welfare, reduced financial risks, and maintained financial stability. Few studies have analyzed Indonesia's financial stability post-fintech growth using the ARDL approach, especially in relation to the link between inclusion and macroeconomic volatility.

LITERATURE REVIEW

According to Rizal and Mukaromah (2025), financial stability is a condition in which the financial system is able to function effectively, resilient to shocks and imbalances, thereby supporting sustainable economic growth. This means that financial institutions, markets, and financial infrastructure function well to allocate funds to investment opportunities, process payments, and absorb economic shocks without disrupting real economic activity. A stable financial system allows funds to flow to investments and businesses, thus driving economic growth (Alsamara et al., 2019). This helps avoid crises that can damage the economy and hinder long-term development. Investors tend to invest in countries with stable and reliable financial systems. Economic growth supported by financial stability creates jobs and improves living standards (Sisiliana et al., 2023).

Financial inclusion has been recognized as a crucial factor in poverty alleviation (Tran & Le, 2021; Abubakr & Kaya, 2021; Hastuti et al., 2023) and as a driver of economic growth (Purwiyanta et al., 2020a; Purwiyanta et al., 2020b; Emara & Said, 2021). Financial inclusion and openness can also contribute to banking stability in developing countries (Shalihina & Safuana, 2021). An inclusive and open financial sector enhances banking stability, as the increased absorption of funds by banks encourages banks to minimize risks and potentially increases bank stability. Banking stability is a key pillar of financial system stability because the majority of public funds are placed in banks (IMF & Bank Indonesia, 2025). The importance of monitoring banks' financial health has also been highlighted in recent studies, with predictive models such as the Altman Z-Score shown to be effective in assessing bank stability (Oyamienlen, 2023). A study by Putri et al. (2024) demonstrates that a country's economic development is closely tied to the role of an inclusive financial sector and the maintenance of financial system stability. This research implies that banks must expand their financial sector networks, making them accessible to the public, thereby building public trust and confidence in owning bank accounts and providing greater access to savings and loans. Consequently, the public can conduct financial transactions easily and efficiently, thereby boosting the economy (Hastuti et al., 2023).

RESEARCH METHOD

The Autoregressive Distributed Lag (ARDL) model is a dynamic econometric model for analyzing long-run and short-run relationships between variables. This model combines the concepts of the autoregressive (AR) model, which incorporates past data of the dependent variable into the model, and the distributed lag (DL) model, which incorporates past data of the explanatory variables. The advantages of ARDL compared to VAR (Vector Autoregression) or VECM (Vector Error Correction Model) are its ability to analyze short- and long-term relationships between

variables with different levels of stationarity (either $I(0)$ or $I(1)$), flexibility on small sample data, non-linearity detection, and simpler cointegration test procedures through Bound Test Cointegration. ARDL also does not require all variables to be cointegrated at the same order, thus providing a more efficient solution than other cointegration methods (Gujarati, 2021). The ARDL model can be written through the following equation:

$$Y_t = \alpha + \beta_0 X_t + \beta_1 X_{t-1} + \dots + \beta_p X_{t-p} + \gamma_1 Y_{t-1} + \dots + \gamma_q Y_{t-q} + e_t \quad (1)$$

To determine the lag length of the independent variables, a sequential procedure can be employed, specifically for determining the optimal ARDL model. The ARDL method involves a bounds testing approach, which is a simple and undemanding method for testing cointegration between variables. After the model is formed, parameter estimation is performed to identify its long-term and short-term effects. The results will show how changes in the explanatory variables affect the dependent variable over time, as well as the extent to which the model returns to long-term equilibrium.

Banking non-performing loan (NPL) data serves as a proxy for financial stability. Higher NPLs indicate increased bank credit risk and potentially increase the risk of bank bankruptcy. Factors determining financial stability include financial inclusion and macroeconomic conditions. Financial inclusion is measured by the number of deposit accounts per 1,000 adults (deposit) and the number of bank credit accounts per 1,000 adults (loan). Macroeconomic variables include inflation and the exchange rate (\$/Rp). Research data obtained from Bank Indonesia publications. The research period, from January 2021 to May 2025, was selected due to the impact of the COVID-19 pandemic on economic hardship. The pandemic has restricted economic activity, making companies vulnerable to default and increasing financial instability.

FINDINGS AND DISCUSSION

The Augmented Dickey-Fuller (ADF) stationarity test is performed to ensure that no variables are stationary at the second or higher levels. ARDL can handle variables that are stationary at the level ($I(0)$) or the first difference ($I(1)$). The test results in Table 1 indicate that no variables are stationary at the level ($I(0)$), so the next test stage is carried out to determine stationarity at the first difference ($I(1)$), where all data are stationary at this level (Table 2).

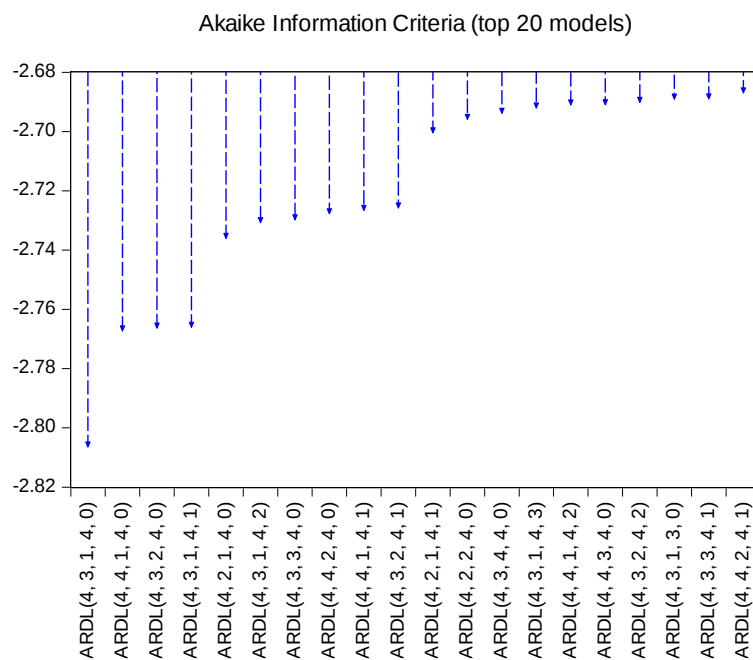
Table 1. Unit Root Test, Level $I(0)$

Method	Statistic	Prob.**		
ADF - Fisher Chi-square	6.15636	0.8020		
ADF - Choi Z-stat	1.96341	0.9752		
** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.				
Intermediate ADF test results UNTITLED				
Series	Prob.	Lag	Max Lag	Obs
financial stability	0.9963	7	10	45
deposit	0.8357	1	10	51
loan	0.8254	0	10	52
inflation	0.8925	0	10	52
exchange rate	0.0751	0	10	52

Table 2. Unit Root Test, First Difference I(1)

Method	Statistic	Prob.**		
ADF - Fisher Chi-square	116.995	0.0000		
ADF - Choi Z-stat	-9.11769	0.0000		
** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.				
Intermediate ADF test results D(UNTITLED)				
Series	Prob.	Lag	Max Lag	Obs
D(financial stability)	0.0215	6	10	45
D(deposit)	0.0000	0	10	51
D(loan)	0.0005	0	10	51
D(inflation)	0.0000	0	10	51
D(exchange rate)	0.0000	0	10	51

The next step is to determine the optimal number of lags for the dependent and independent variables. This can be done using information criteria such as the Akaike Information Criterion (AIC) or the Schwarz Bayesian Criterion (SBC). The following are the results of determining the optimal lag based on the AIC (Figure 1).

**Figure 1.** ARDL Lag Order Selection Criteria

Financial stability is influenced by financial inclusion and long-term macroeconomic variables (Table 3). Greater public access to savings accounts can reduce the risk of bank failure. Higher third-party funds increase banks' ability to convert liquidity into assets that can boost profits. However, increased public access to banking credit can increase the risk of bank bankruptcy due to an increase in non-performing loans (NPLs). Bank asset and liability management is crucial for financial stability.

Table 3. ARDL Long Run Form and Bounds Test

Levels Equation				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
deposit	-0.000987	9.93E-05	-9.941516	0.0000
loan	0.000573	0.000214	2.680418	0.0115
inflation	0.072475	0.016719	4.334891	0.0001
exchange rate	-0.085274	0.043744	-1.949406	0.0601
C	6.571536	0.477749	13.75521	0.0000
EC = financial stability - (-0.0010*deposit + 0.0006*loan + 0.0725*inflation -0.0853* exchange rate + 6.5715)				
F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
Asymptotic: n=1000				
F-statistic	4.689656	10%	2.2	3.09
K	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37

In relation to macroeconomic conditions, it is crucial to maintain economic stability, including control over inflation and exchange rates, to ensure a country's financial stability. High inflation and the depreciation of the rupiah against the US dollar must be closely monitored, as they can disrupt financial stability in Indonesia. High inflation reduces public purchasing power and can lead to an increase in non-performing loans (NPLs) due to a weakening business environment and credit constraints. Fluctuations in foreign exchange rates can lead to volatility in the earnings of banks that are exposed to foreign currencies, thereby impacting financial stability. Unstable macroeconomic conditions can trigger systemic risk in the financial system, potentially leading to significant disruptions in the banking intermediation function.

Table 4. ARDL Error Correction Regression

ECM Regression				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(financial stability (-1))	0.223588	0.127174	1.758122	0.0883
D(financial stability (-2))	0.232538	0.131890	1.763121	0.0874
D(financial stability (-3))	0.776020	0.115540	6.716447	0.0000
D(deposit)	-0.000875	0.000257	-3.410211	0.0018
D(deposit (-1))	0.000456	0.000248	1.833818	0.0760
D(deposit (-2))	-0.000595	0.000231	-2.582884	0.0146
D(loan)	-0.000922	0.000258	-3.578613	0.0011
D(inflation)	0.004356	0.017077	0.255094	0.8003
D(inflation (-1))	0.042451	0.018883	2.248054	0.0316
D(inflation (-2))	0.060451	0.021284	2.840192	0.0078
D(inflation (-3))	0.065151	0.024671	2.640807	0.0127
CointEq(-1)*	-0.735011	0.128861	-5.703901	0.0000

R-squared	0.763098	Mean dependent var	-0.018988
Adjusted R-squared	0.692668	S.D. dependent var	0.087312
S.E. of regression	0.048404	Akaike info criterion	-3.009588
Sum squared resid	0.086688	Schwarz criterion	-2.546285
Log likelihood	85.73491	Hannan-Quinn criter.	-2.833812
Durbin-Watson stat	2.123938		

* p-value incompatible with t-Bounds distribution

In the short-term ARDL model, the CointEq(-1) value is significantly negative, indicating that the ARDL model used is valid (Table 4). There is no reason to reject the model, where financial inclusion has a significant effect on financial stability with varying time lags. Only the macroeconomic variable inflation can affect financial stability in the short term. This result is consistent with the long-term model, except for the exchange rate.

The ARDL model has also passed the classical assumption test, including the normality test (Figure 2), where the Jarque-Bera probability value is greater than 0.05 (at $\alpha = 5\%$), so that the hypothesis of a normally distributed model is accepted. The autocorrelation test in Table 5, where the Obs*R-squared value is greater than 0.05 (at $\alpha = 5\%$), so that the null hypothesis of no autocorrelation can be accepted. Finally, the heteroscedasticity test in Table 6 shows that there is homoscedasticity in the model. Thus, the model meets the requirements of the Best Linear Unbiased Estimator.

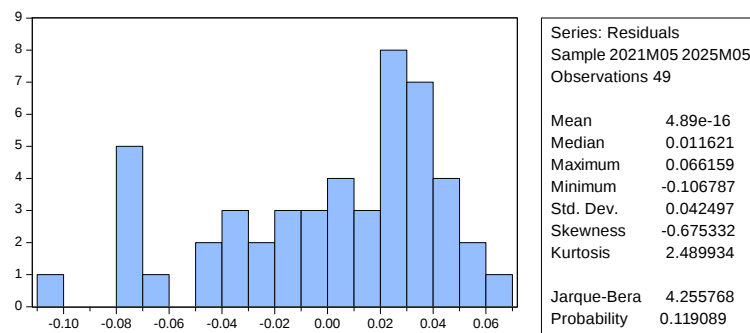


Figure 2. Normality Test

Table 5. Breusch-Godfrey Serial Correlation LM Test

F-statistic	0.195140	Prob. F(2,30)	0.8238
Obs*R-squared	0.629270	Prob. Chi-Square(2)	0.7301

Table 6. Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.831778	Prob. F(16,32)	0.6435
Obs*R-squared	14.39276	Prob. Chi-Square(16)	0.5695
Scaled explained SS	4.572872	Prob. Chi-Square(16)	0.9975

The ARDL model must also be stable, as stability indicates that the regression coefficients are consistent and the model can be used to make accurate predictions in both the long and short terms, without any undetected structural changes. Model stability also ensures that there are no autocorrelation problems and that the model can correct deviations from the long-run

equilibrium. The results of the stability test indicate that the ARDL model used is stable (Figure 3).

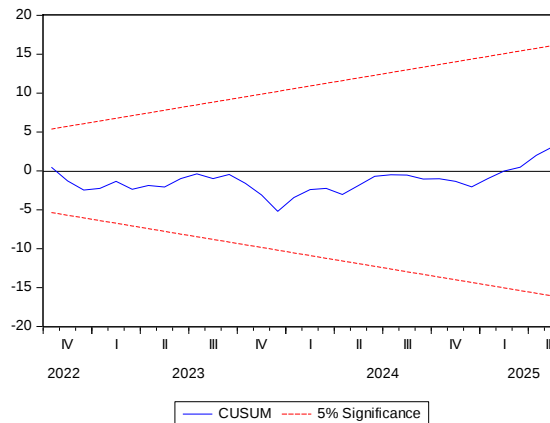


Figure 3. ARDL Model Stability Test

ARDL estimates show that financial inclusion strengthens stability through savings, as greater access to savings accounts increases third-party financing and reduces the risk of default. However, credit-based inclusion actually increases instability, as it leads to an increase in non-performing loans (NPLs), especially when not balanced with good financial literacy and effective risk management (Yudaruiddin et al., 2024). Compared to other developing countries such as Malaysia, Thailand, and the Middle East and North Africa (MENA) region, Indonesia shows a stronger impact on credit. In these countries, the expansion of inclusive credit is more moderate because it is supported by effective financial supervision and credit rating systems, as well as stricter banking governance (Hakimi et al., 2024; Banna et al., 2024).

The results of this study confirm that the expansion of credit inclusion in Indonesia can weaken stability if it is not accompanied by adequate macroprudential management and regulation. In addition, financial stability is also influenced by inflation and exchange rates, so it is important to control both in order to maintain the resilience of the financial system (Yudaruiddin et al., 2024).

CONCLUSIONS

Financial inclusion supports financial stability by expanding public access to financial services. With better access, people can manage their finances more effectively, reduce their vulnerability to risk, and actively participate in the formal economic system, ultimately strengthening the resilience and stability of the financial system as a whole. Access to savings and credit enables people to manage their finances better, plan for the future, address urgent needs, and protect themselves from financial shocks. This creates a more financially stable and prosperous society, which collectively enhances economic stability. As more people become connected to the formal financial system, the flow of funds and transactions becomes more orderly and secure. This enables the government, through central banks such as Bank Indonesia, to manage monetary and macroprudential policies more effectively, which in turn strengthens financial system stability (Ijaz et al., 2020). Macroeconomic conditions also influence financial stability through indicators such as inflation and exchange rates, which directly impact bank profitability and risk. Good macroeconomic stability (moderate inflation and exchange rate stability) creates a conducive environment for sustainable economic growth and investor confidence, while macroeconomic fluctuations can increase systemic risk and threaten financial system stability. This study advances research by applying ARDL in a fintech-accelerated context, showing dual effects of inclusion (stabilizing through deposits, destabilizing through credit). Therefore, policies to accelerate fintech

development must strike a balance between encouraging the use of digital savings for stability and managing excessive credit risk.

LIMITATIONS & FURTHER RESEARCH

Future research on financial system stability could focus on analyzing financial digitalization and its impact on stability, as well as examining the role of fintech innovation in risk mitigation. While digitalization can enhance stability through increased efficiency, financial inclusion, and transaction transparency, it also creates new challenges and risks, such as cybersecurity threats and potential volatility, which require appropriate regulation and management from central banks and governments to maintain economic integrity. The limitations of this study are reliance on aggregate secondary data, exclusion of sectoral or micro-level data, a short time frame (2021–2025), and limited macro variables (only inflation and FX). Suggest richer datasets (panel, cross-country, fintech-specific indicators) for future work.

REFERENCES

- Abubakr, M. & Kaya, T. (2021). A Comparison of E-Government Systems Between Developed and Developing Countries: Selective Insights From Iraq and Finland. *International Journal of Electronic Government Research (IJEGR)*, 17(1), 1-14. <https://doi.org/10.4018/IJEGR.2021010101>.
- Adeabah, D. (2023). Reputational risks in banks: A review of research themes and directions for future research. *Journal of Economic Surveys*. <https://doi.org/10.1111/joes.12506>.
- Alsamara, M., Mrabet, Z., Jarallah, S., & Barkat, K. (2019). The switching impact of financial stability and economic growth in Qatar: Evidence from an oil-rich country. *Quarterly Review of Economics and Finance*, 73, 205–216. <https://doi.org/10.1016/j.qref.2018.05.008>.
- Astuti, R. D., & Purwiyanta, P. (2021). The effect of economic digitization on financial inclusion and international trade in Southeast Asia. *RSF Conference Series: Business, Management and Social Sciences*, 1(3), 115–122. <https://doi.org/10.31098/bmss.v1i3.296>.
- Astuti, R. D., Purwiyanta, P., & Udjianto, D. W. (2023). The impact of digital economy on economic growth in Southeast Asia. *International Journal of Advanced Economics*, 5(1), 10–17. <https://doi.org/10.51594/ijae.v5i1.430>.
- Bank Indonesia. (2025). *Kajian Stabilitas Keuangan, No 45, Agustus 2025*. Bank Indonesia.
- Banna, H., & Hassan, M. K. (2024). Financial inclusion and banking stability: Evidence from emerging economies. *Applied Economics*, 56(24), 2900–2914. <https://doi.org/10.1080/00036846.2023.2203456>.
- Barkat, K., Mimouni, K., Alsamara, M., & Mrabet, Z. (2024). Achieving the sustainable development goals in developing countries: The role of remittances and the mediating effect of financial inclusion. *International Review of Economics & Finance, Elsevier*, 95(C). <https://doi.org/10.1016/j.iref.2024.103460>.
- Emara, N., & El Said, A. (2021). Financial inclusion and economic growth: The role of governance in selected MENA countries. *International Review of Economics & Finance*, 75, 34–54. <https://doi.org/10.1016/j.iref.2021.03.014>.
- Gujarati, D. N. (2012). *Econometrics by Examples*. Palgrave Macmillan.
- Hakimi, A., Saidi, H., & Adili, L. (2025). Does financial inclusion affect non-performing loans and liquidity risk in the MENA region? A comparative analysis between GCC and non-GCC countries. *Economies*, 13(5), 143. <https://doi.org/10.3390/economies13050143>
- Hastuti, S. R. B., Udjianto, D. W., Astuti, R. D., & Sriwinarti, A. (2023). The Nexus of Financial Development, Macroeconomic Indicators, and Poverty in ASEAN Countries. *International Journal of Social Science And Human Research*, 06(03), 1882–7.

- <https://doi.org/10.47191/ijsshr/v6-i3-64>.
- Ijaz, S., Hassan, A., Tarazi, A., & Fraz, A. (2020). Linking bank competition, financial stability, and economic growth. *Journal of Business Economics and Management*, 21(1), 200–221. <https://doi.org/10.3846/jbem.2020.11761>.
- International Monetary Fund (IMF), & Bank Indonesia. (2025). *Indonesia: Financial Sector Assessment Program (FSAP)*. IMF Country Report No.25/2. Washington, D.C.: International Monetary Fund.
- Khan, N., Zafar, M., Okunlola, A.F., Zoltan, Z., Robert, M. (2022). Effects of Financial Inclusion on Economic Growth, Poverty, Sustainability, and Financial Efficiency: Evidence from the G20 Countries. *Sustainability*, 14, 12688. <https://doi.org/10.3390/su141912688>.
- Malik, A. H., Isa, A. H. bin M., Jais, M. bin, Rehman, A. U., & Khan, M. A. (2022). Financial stability of Asian nations: Governance quality and financial inclusion. *Borsa Istanbul Review*, 22(2), 377–387. <https://doi.org/10.1016/j.bir.2021.05.005>.
- Mishkin, F. S. (2019). *The Economic of Money, Banking, and Financial Markets* (12th Ed.). Pearson Education Inc, New York.
- Oyamienlen, G. (2023). Predicting financial stability of banks in nigeria using the Altman Z Score model. *Journal of Economics, Finance and Management Studies*, 06(06), 2479–2486. <https://doi.org/10.47191/jefms/v6-i6-06>.
- Purwiyanta, P., Pujiharjanto, A., Astuti RD. (2020). The Impact of Financial Inclusion on Economic Growth in Indonesia: Panel Data 34 Province. *Conf Ser 2020 Econ Bus Ser*, 16(1), 12–29. <https://doi.org/10.31098/ebs.v1i1.73>.
- Purwiyanta, P., Pujiharjanto, A., Astuti, R. D., Kijkasiwat, P. (2020). The Causality of Financial Inclusion and Economic Growth in Indonesia. *Jurnal Analisis Bisnis Ekonomi*, 20(1), 18–30. <https://doi.org/10.31603/bisnisekonomi.v20i1.6453>.
- Putri, N.H., Sukarniati, L., Asmara, G.D., & Purna, F.P. (2024). Analysis of Financial Inclusion and Financial Stability on Economic Development in APEC Member Country. *Optimum: Jurnal Ekonomi dan Pembangunan*, 14(2), 213–223. <https://doi.org/10.12928/optimum.v14i2.9872>.
- Rizal, F., & Mukaromah, H. (2025). Bank Indonesia's Role in Maintaining Financial Stability Amid Economic Recovery : A Qualitative Studi (2021–2023). *Journal of Economic and Social Sciences (JESS)*, 4(1), 367–374. <https://doi.org/10.59525/jess.v4i1.801>.
- Shalihina, M. A., & Safuana, S. (2021). Effects of Financial Inclusion and Openness on Banking Stability: Evidence from Developing and Developed Countries. *Economics and Finance in Indonesia*, 67(2), 212–222. <https://doi.org/10.47291/efi.v67i2.967>.
- Sisiliana, S., Pratiwi, D., Tarigan, V. E., Deo, S. F., Dewi, Z. A., & Rangkutty, D. M. (2023). Studi Kajian Sektor Moneter terhadap Stabilitas Sistem Keuangan di Indonesia. *Student Research Journal*, 1(4), 183–188. <https://doi.org/10.55606/srjyappi.v1i4.515>.
- Syaputra, R., & Adry, M. R. (2019). Pengaruh Variabel Makroekonomi terhadap Stabilitas Sistem Keuangan di Indonesia (Melalui Pendekatan Moneter). *Jurnal Kajian Ekonomi dan Pembangunan*, 1(2), 473–486. <http://dx.doi.org/10.24036/jkep.v1i2.6257>.
- Tran, H. T. T., & Le, H. T. T. (2021). The impact of financial inclusion on poverty reduction. *Asian Journal of Law and Economics*, 12(1), 95–119. <https://doi.org/10.1515/ajle-2020-0055>.
- Yudaruddin, R., Nugroho, B. A., Mardiany, Fitriani, Z., Hapsari, P., Fitrianto, Y., & Santi, E. N. (2024). Liquidity and Credit Risk in Indonesia: The Role of FinTech Development. *Sage Open*, 14(2). <https://doi.org/10.1177/21582440241245248>.