MJIFM | MAJAPAHIT JOURNAL OF ISLAMIC FINANCE AND MANAGEMENT

Vol. 5 No. 1, 2025, 421–447 e-ISSN 2798-0170

# DOES FINANCIAL INCLUSION AFFECT FINANCIAL SYSTEM STABILITY? EVIDENCE FROM INDONESIA

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**Abstract**

Financial system stability represents a fundamental component of the economy, as it facilitates the efficient functioning of financial transactions. It is argued that the financial inclusion tends to enhance the financial stability. This study aims to investigate the effect of financial inclusion variables through fintech integration specifically Peer-to-Peer (P2P) lending, E-Money, and Interest Rates on Financial System Stability (FSS) in Indonesia, with the Non-Performing Loan (NPL) ratio serving as a proxy. The analysis uses the Vector Error Correction Model (VECM) with monthly time series data from 2018-2023. The results of this study show that only the E-Money variable has a significant influence on Financial System Stability, both in the short term and the long term. In contrast, Peer-to-Peer lending and Interest Rates do not significantly affect Financial System Stability in either the short or long term. This study emphasizes the need for policymakers undertake comprehensive and well-considered policy measures in advance of implementing financial inclusion-oriented initiatives. It is recommended that financial institutions strengthen the supervision of peer-to-peer (P2P) lending activities to mitigate the risk of default. Furthermore, enhancing public awareness of the advantages of cashless transactions is essential to promote the adoption of non-cash payment instruments.

**Keywords:** Financial System Stability, Financial Inclusion, Peer-To-Peer Lending, E-Money, Interest Rate

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## INTRODUCTION

In an economy, financial system stability is crucial as it ensures the smooth operation of financial transactions, which in turn drives economic growth by increasing output efficiency (Saraswati & Tisnawati, 2021). Financial instability leads to a financial crisis. The 1997–1998 economic crisis in Indonesia once threatened the stability of the national financial system. Restoring public confidence in the financial system took a long time due to the high cost of the crisis. This crisis demonstrated that an unstable financial sector is more vulnerable to various shocks that can hinder economic growth (Novella & Syofyan, 2019).

Indonesia's financial system came under pressure again in 2008 due to the global financial crisis. As a result, financial system stability was disrupted, marked by a weakening rupiah, a decline in company revenues, and difficulties in loan repayments. Currently, financial system stability in Indonesia is well maintained, as reflected in the Non-Performing Loan (NPL) ratio. The NPL ratio indicates the percentage of borrowers who are unable to repay their loans as agreed (Morgan & Pontines, 2014).

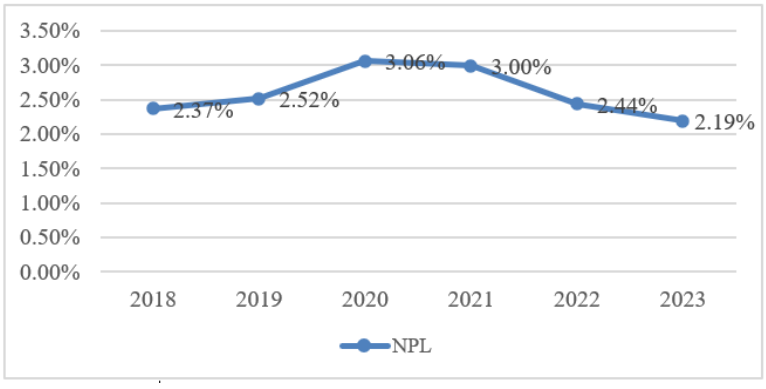


**Figure 1.**
**Financial System Stability**

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Source: SSKI Bank Indonesia (2025)

Figure 1 shows that NPLs in Indonesia from 2018 have experienced increasing fluctuations. Moreover, in 2020, the NPL ratio experienced an upward trend, exceeding 3%, due to the outbreak of COVID-19, which caused borrowers from banks and other financial institutions to face difficulties in repaying or settling their loans (Databooks, 2024). While in 2023, the gross NPL ratio in the banking sector was recorded at 2.19%. Although this shows a slight increase, the figures remain within the safe limit set by Bank Indonesia, which is 5% (CNBC Indonesia, 2024).

The condition of a country's financial system can be reflected by the NPL ratio. A low Non-Performing Loan (NPL) ratio indicates the stability of a country's financial system, whereas a high NPL ratio signifies financial instability, often resulting from inefficiencies in the banking sector's management of credit risk and non-performing assets (Novella et al., 2019). Financial inclusion serves as a strategic policy measure aimed at fostering the stability of the financial system. Financial inclusion aims to promote inclusive growth by reducing poverty and ensuring that the unbanked population can easily access financial services, including transfers, payments, credit, insurance, investment, and savings (Dienillah et al., 2016). Financial inclusion programs are necessary to build a more accessible financial system, thereby promoting economic growth and reducing poverty (Awanti, 2018).

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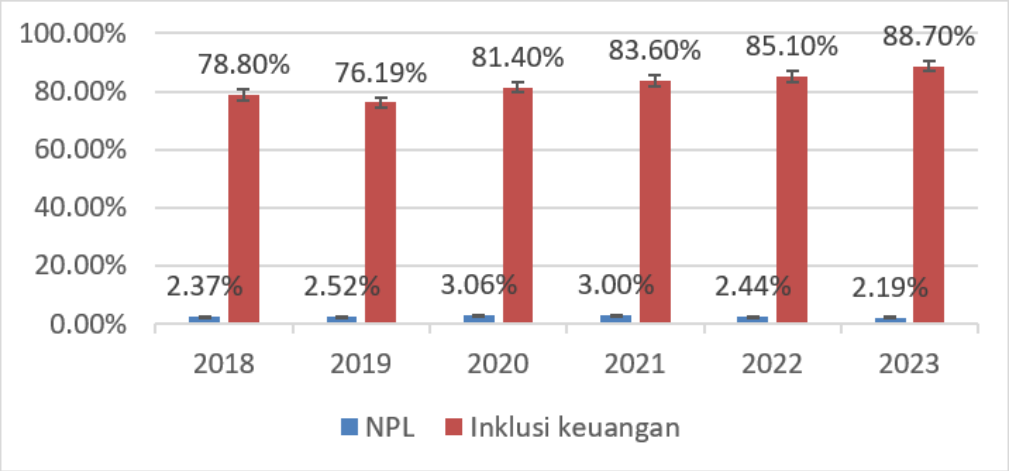


**Figure 2.**
**Financial Inclusion in Relation to NPL**
Source: Bank Indonesia dan National Financial Inclusion Survey (2024)

Figure 2 shows that financial inclusion increased from 2018 to 2020, indicating that more people had access to formal financial services such as bank accounts, loans, insurance, and digital financial services. However, from 2018 to 2020, NPL (Non-Performing Loans) also rose, with the highest NPL rate in 2020 at 3.06%. This spike was influenced by the economic instability caused by the COVID-19 pandemic, which led to many borrowers struggling to repay their debts, signaling a decline in the stability of the financial system.

From 2021 to 2023, financial inclusion continued to rise, but NPLs decreased, driven by the post-pandemic economic recovery. The increase in financial inclusion ultimately contributed to the stability of the financial system after the initial adjustment phase from 2018 to 2020. With financial education, strengthened regulations, and economic recovery, people became more responsible in using financial services.

The financial inclusion program in the era of digital globalization currently affects economic growth in the financial sector. In Indonesia, technological

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advancements have significantly changed the perspective on financial services (Jange et al., 2024). Digital financial inclusion, often referred to as Financial Technology (FinTech) has emerged as an alternative to meet the public's need for financial services. FinTech services such as digital payments, loans, and insurance are easier and more convenient to use.

According to Kusuma et al., (2020), there are several types of FinTech in Indonesia, including Asset Management, Crowdfunding, E-money, Peer-to-Peer (P2P), E-wallets, and Insurance. This study focuses on Peer-to-Peer lending and e-money as key fintech elements, and also interest rates playing a significant role in fintech analysis. Peer-to-Peer lending is the most dominant FinTech service favored by the public, as it facilitates entrepreneurs in obtaining sources of loans. The factors driving this increase are the convenience and speed of the process offered by P2P lending. The public is becoming more familiar with P2P lending as an alternative to meet their financial needs. For individuals who qualify for credit but do not have access to banking services (unbanked), P2P lending plays a role in opening access to financing and reducing the gap in meeting credit needs in (Wajuba et al., 2021).

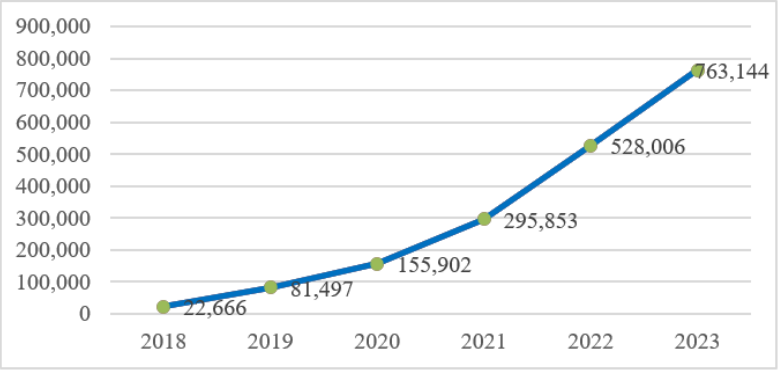


**Figure 3:**
**The Cumulative Disbursement of Peer-to-Peer Lending Loans**
Source: Bank Indonesia (2024)

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Figure 3 illustrates that Peer-to-Peer (P2P) lending in Indonesia has seen significant growth over the last six years. Between 2018 and 2023, the value steadily rose, reaching 763.144 trillion Rupiah by December 2023, highlighting a consistent increase in the adoption of P2P lending services and strong public confidence in P2P platforms as a financing source."

Numerous studies have been conducted on financial system stability. For example, Saraswati & Tisnawati (2021) found that FinTech P2P lending and payment FinTech have only long-term effects on Indonesia's financial structure. P2P lending FinTech may eventually lead to financial system instability, while payment FinTech is expected to enhance financial stability in Indonesia. Meanwhile, a study by Safi'i & Fadli (2024), indicates that P2P FinTech has a negative and significant impact on financial system stability, as the increasing number of borrowers leads to a decline in financial system stability.

The most popular payment FinTech among the public is e-money for conducting cashless transactions (Saraswati & Tisnawati, 2021). Payment methods have also continued to evolve from cash-based transactions to non-cash payments, supported by increasingly advanced technology (Zunaitin et al., 2017). From 2020 to 2023, the total value of electronic money transactions has continued to rise, driven by the adoption of digital technology, changes in consumer behavior, the growth of e-commerce, and increased public awareness of financial security.

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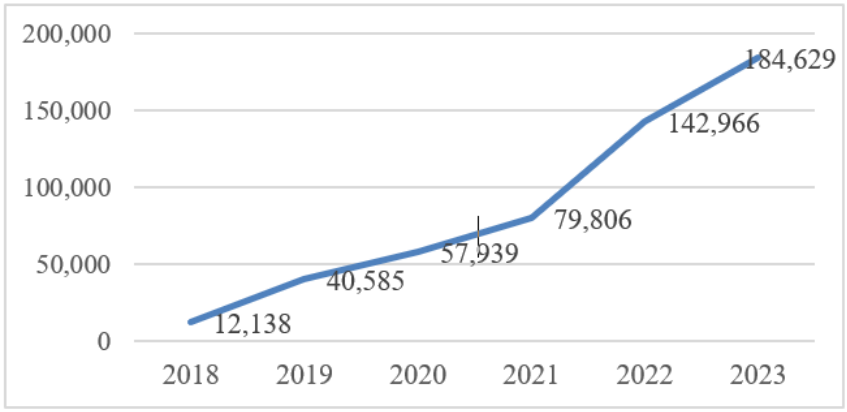


**Figure 4.**
**Growth of E-Money Transactions**
Source: Bank Indonesia (2024)

Figure 4 demonstrates a steady upward trend in e-money transactions. In 2019, the value of e-money transactions surged to IDR 40.59 trillion, compared to IDR 12.14 trillion in 2018. This upward momentum continued from 2020 to 2023, driven by the increasing adoption of digital technology, shifts in consumer behavior, the rapid growth of e-commerce, and rising public awareness of financial security. The rise in e-money transactions has significantly contributed to the advancement of electronic payment systems. Currently, many individuals rely on e-money for their transactions due to its efficiency and ability to streamline financial activities. According to the study by Aksari & Sulistyono (2022), the e-money variable has a significant effect on the stability of Indonesia's financial system. However, based on research by Rusdianasari (2018), FinTech products such as e-money do not have a significant impact on financial system stability.

Interest rates are one of the key elements in determining the stability of the financial system, as fluctuations in interest rates impact financial system stability. When loan interest rates increase, people tend to avoid borrowing, which in turn causes banks to face difficulties in distributing their funds (Viphindrartin, 2021).

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Although interest rates are not a direct instrument of financial inclusion, they serve as a supporting instrument that can influence the stability of the financial system. Therefore, the researcher includes interest rates in this study.

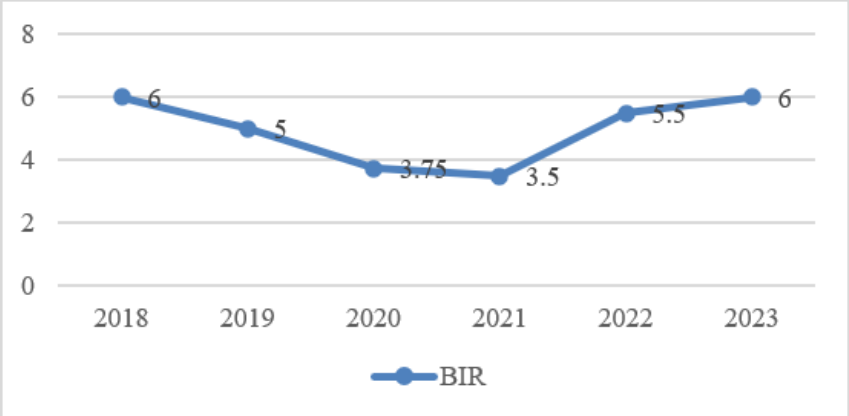


**Figure 5.**
**Interest Rate**
Source: Central Bureau of Statistics (2024)

Based on Figure 5, interest rates in Indonesia have experienced fluctuations. In 2018, the interest rate stood at 6%. Subsequently, Bank Indonesia lowered the interest rate to 3.75% in 2020 and further to 3.5% in 2021, as a response to the COVID-19 pandemic. This policy was implemented to stimulate economic growth and maintain national economic stability. However, from 2022 to 2023, interest rates increased again to 6% as a measure to control the rupiah exchange rate amid global uncertainty. In the study by Viphindrartin (2021), interest rates were found to significantly influence financial system stability. Meanwhile, research conducted by (Hadiningsih, 2024) shows that interest rates do not have a significant effect on the Bank Z-score variable or financial stability. This condition occurs because interest rates, interpreted as a monetary variable, do not directly affect public access to financial inclusion.

While most prior studies have concentrated solely on monetary factors in assessing financial system stability, this research shifts its focus to digital finance

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or fintech to examine financial stability. Although interest rate is not considered an indicator or component of fintech, it plays a crucial role in both fintech analysis and financial stability. So, this study seeks to investigate how factors such as peer-to-peer lending, e-money, and interest rates affect the financial stability system in Indonesia, considering both short-term and long-term relationships.

## LITERATURE REVIEW

### Financial System Stability

Financial System Stability (FSS) refers to a stable financial system that is capable of managing financial resources and withstanding shocks, thereby preventing disruptions to the real sector and the financial system (Gunadi et al., 2013). According to Bank Indonesia (2020), when markets are unstable (instability), it can harm the economy and threaten economic performance, ultimately paralyzing the financial conditions of households, businesses, and the government, and causing limited capital flow.

The financial system is an interconnected structure, meaning that instability in one component can directly affect the others. Therefore, a significant decline in asset values, the failure of non-bank financial institutions, the bankruptcy of non-financial corporations, or a combination of these events can disrupt financial markets. This phenomenon is generally referred to as financial system instability (Rahmawati et al., 2019). A stable financial system is resilient and robust in the face of various economic disturbances, enabling it to perform its intermediation function effectively and support economic expansion. Advancements in financial industry technology have become increasingly global, resulting in a more interconnected financial system that transcends national

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borders and time differences. Furthermore, as financial products become more complex, they also grow increasingly diverse and dynamic.

**Financial Inclusion**

According to Kurniawan & Vaulia (2022:1), financial inclusion is the process of ensuring the availability of financial services and products for all segments of society, especially low-income individuals, at affordable costs through fair and transparent mechanisms provided by relevant institutions. Financial inclusion is the provision of financial access to all poor and marginalized communities (Holle & Shalihah ,2022:6).

The efforts to enhance financial inclusion have evolved beyond merely developing financial services and products. They now also encompass four additional aspects: expanding financial access, ensuring availability, promoting usage, and improving the quality of financial services and products.

**Financial Technology**

Financial Technology (FinTech) is an innovation in the financial services industry that utilizes technology. FinTech products are typically systems developed to facilitate specific financial transactions, including payments, funding such as lending and borrowing, digital banking, capital markets, insurance (insurtech), supporting services (supporting FinTech), and other forms of digital financial innovations (Suyanto ,2023:27).

Fintech refers to financial services that leverage technology to make financial transactions and services more effective and efficient. The development of fintech has influenced various sectors within the financial services industry, including banking, capital markets, insurance, and other financial institutions. With advancements in technology and information, financial services aim to

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deliver innovation, improve technological efficiency and system stability, and enhance resilience and security. Fintech offers a range of innovative services through the use of digital devices

**Peer to Peer Lending**

Peer-to-Peer (P2P) Lending is a platform that connects lenders and borrowers through the internet. P2P Lending provides credit mechanisms and risk management. This platform helps both lenders and borrowers meet their respective needs and promotes efficient use of funds. P2P loans allow borrowers to obtain funds directly from individuals without the intermediation of banks or traditional financial institutions (Hanafi ,2021:20).

**E-Money**

According to Bank Indonesia (2024), electronic money or e-money is defined as a payment instrument in electronic form, where the monetary value is stored on a specific electronic medium. E-money is a highly effective and efficient means of payment for services such as trains, buses, parking, toll roads, fast food, and other types of transactions. Nowadays, many banks and non-bank institutions have started issuing electronic money (Firmansyah & Dacholfany ,2018:76).

Currently, an increasing number of banks and non-bank institutions are beginning to issue electronic money. It is predicted that the use of electronic money will continue to grow in the future, in line with the rising needs of society. Some electronic money products issued by banks include the Flazz card by BCA, the e-money card by Bank Mandiri, and the Brizzi card by Bank BRI. Several electronic money products are also offered by telecommunication companies,

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such as T-Cash Tap by Telkomsel, XL Axiata, Flexy Cash, and Dompetku Ooredoo by Indosat.

**Interest rates**

Interest rates can be seen as compensation given by lenders to customers who buy or sell goods based on conventional principles. The cost that must be paid to customers (who have savings) and the cost that must be paid by consumers to banks (customers who receive loans) are both referred to as interest (Kasmir,2014:114).

The interest rate is a monetary variable that represents the percentage return on capital lent to another party. The determination of interest rates often refers to the BI Rate, which is the benchmark rate set and announced by Bank Indonesia as part of its monetary policy, and is publicly disclosed. Interest rates can also be understood as the cost paid by borrowers for the funds they receive, as well as compensation to lenders for their investment.

## RESEARCH METHOD

This study employs a quantitative method. The secondary data are used in monthly time series data from 2018 to 2023, sourced from the Financial System Statistics of Indonesia (SSKI) of Bank Indonesia, FinTech Statistics of the Financial Services Authority (OJK), the Payment System and Financial Market Infrastructure Statistics (SPIP) of Bank Indonesia, and Central Bureau of Statistics of Indonesia (BPS). The dependent variable in this study is financial stability measured by the Non-Performing Loan (NPL).

The independent variables are financial inclusion integrated with FinTech, consisting of Peer-to-Peer Lending (X1), E-Money (X2), and Interest Rates (X3).

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Peer to peer lending was measured by the Cumulative Loan Amount. Peer to peer lending was measured in billion Rupiahs and it was employed the natural logarithm for analysis purposes. Moreover, E-money was measured by E-money transaction value in Rupiah, so it was employed the natural logarithm for analysis purposes. The interest rate (IR) is represented by the BI Rate, which serves as Bank Indonesia's policy rate aimed at enhancing the effectiveness of its monetary operations framework. While interest rate is not classified as indicators or elements of fintech, it holds a significant role in analyzing fintech and maintaining financial stability.

This study uses the Vector Error Correction Model (VECM). This Model is used to examine both the short-term and long-term relationships among the variables(Amri, 2018). The general form of the VECM model is as follows:

$$\Delta SSK_{it} = \propto_0 + \sum_{j=1}^{n} \beta_{1j}\, \Delta P2P_{i,t-j} + \sum_{j=1}^{n} \beta_{2j}\, \Delta EMONEY_{i,t-j} + \sum_{j=1}^{n} \beta_{2j}\, \Delta BIR_{i,t-j} + \gamma e_{i,t-1} \varepsilon_{it}$$

Several stages in VECM testing include: stationarity test, optimal lag selesction, Johannes cointegration test, Granger Causality Test, VECM Estimation (Vector Error Correction Model), Impulse Response Function (IRF) Test, Variance Decomposition (VDC) Test (Ajija, 2011).

## RESULTS AND DISCUSSION

### Stationarity Test of Variables

The first stage of the data processing is to test the stationarity of the data. The stationarity test used in this study is the Augmented Dickey-Fuller (ADF) test. The ADF analysis results, obtained using EViews software, are compared with the critical values. The data is considered non-stationary if the t-statistic is

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smaller than the critical value. Conversely, the data is deemed stationary if the t-statistic exceeds the critical value.

**Table 1.**
**ADF Test Results at Level and First Difference**

| Variable | Level | | First Difference | |
|---|---|---|---|---|
| | t-statistic ADF | Critical Value (5% level) | t-statistic ADF | Critical Value (5% level) |
| SSK | -2.096995 | -2.902953 | -8.647173 | -2.903566 |
| Peer to Peer | -4.157435 | -2.907660 | -9.501808 | -2.904198 |
| E-Money | -2.355452 | -2.903566 | -14.38100 | -2.903566 |
| Suku Bunga | -1.376005 | -2.903566 | -4.030600 | -2.903566 |

Source: Processed Data Results using EViews 12 (2025)
Note: * = Variable is Stationary at the 5% Critical Value

The results of the stationarity test show that none of the variables are stationary at the level. This can be seen from the ADF t-statistic values being smaller than the critical value. However, the stationarity test results at the first difference level show that the ADF statistic values are greater than the critical value, indicating that the data is stationary at the first difference level.

**Optimal Lag Selection Results**

The criteria used in this study to determine the optimal lag length involve selecting the lag with the highest number of asterisks (*).

**Table 2.**
**Optimal Lag Length Selection**

| Lag | LogL | LR | FPE | AIC | SC | HQ |
|---|---|---|---|---|---|---|
| 0 | -202.9503 | NA | 0.005171 | 6.086774 | 6.217333 | 6.138505 |
| 1 | -156.0983 | 86.81409* | 0.002089* | 5.179361* | 5.832157* | 5.438019* |
| 2 | -142.1453 | 24.21246 | 0.002230 | 5.239568 | 6.414602 | 5.705153 |

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| | | | | | | |
|---|---|---|---|---|---|---|
| 3 | -129.8961 | 19.81493 | 0.002522 | 5.349885 | 7.047156 | 6.022396 |

Source: Processed Data Results using EViews 12 (2025)

Note: * = Indicates the optimal lag suggested by EViews 12

The results of the lag length calculation show that lag 1 is the ideal lag length. Based on the recommended criteria FPE, AIC, SC, and HQ lag 1 is the best choice. Therefore, it can be concluded that the selected model for this study uses lag 1, as it satisfies the cointegration test, which is a prerequisite for further investigation.

**Johansen Cointegration Test Results**

Johansen Cointegration Test is done by comparing the trace statistic and maximum eigenvalue with the critical value at a 5% significance level. If the trace statistic is greater than the critical value, cointegration exists

**Table 3.**
**AIC and SC Results on Johansen Cointegration Index**

| Data Tren yang Direkomendasi | |
|---|---|
| **Akaike Information Criteria (AIC)** | **Schwarz Criteria (SC)** |
| 1: None: No Intercept No Trend | 1: None: No Intercept No Trend |

Source: Processed Data Results using EViews 12 (2025)

There are two appropriate criteria for determining the trend: AIC and SC. This does not affect the choice between AIC and SC as the criterion to be used.

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**Table 4.**
**Cointegration Test (Trace Statistic)**

| Hypothesized No. of CE(s) | Eigenvalue | Trace Statistic | 0.05 Critical Value | Prob.** |
|---|---|---|---|---|
| None * | 0.603917 | 155.2204 | 40.17493 | 0.0000 |
| At most 1 * | 0.483066 | 91.31730 | 24.27596 | 0.0000 |
| At most 2 * | 0.394552 | 45.78829 | 12.32090 | 0.0000 |
| At most 3 * | 0.149399 | 11.16503 | 4.129906 | 0.0010 |

Source: Processed Data Results using EViews 12 (2025)

**Note:** * indicates that the Trace Statistic value is greater than the 5% Critical Value.

The results of the trace statistic cointegration test show that in the first column, the trace statistic value of 115.2204 is greater than the 5% critical value of 40.17493, and the probability value is less than 0.05, or 0.00. In the second column, the trace statistic value of 91.31730 is greater than the critical value of 24.27596. Similarly, in the third column, the trace statistic value of 45.78829 is greater than the 5% critical value of 12.32090, and the probability is less than 0.05, or 0.00. In the fourth column, the trace statistic value of 11.16503 is greater than the critical value of 4.129906, and the probability is also less than 0.05, or 0.00. It can be concluded that a cointegration relationship exists.

**Table 5.**
**Cointegration Test (Max-Eigenvalue)**

| Hypothesized No. of CE(s) | Eigen value | Trace Statistic | 0.05 Critical Value | Prob.** |
|---|---|---|---|---|
| None * | 0.603917 | 63.90307 | 24.15921 | 0.0000 |
| At most 1 * | 0.483066 | 45.52901 | 17.79730 | 0.0000 |
| At most 2 * | 0.394552 | 34.62326 | 11.22480 | 0.0000 |
| At most 3 * | 0.149399 | 11.16503 | 4.129906 | 0.0010 |

Source: Processed Data Results using EViews 12 (2025)

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The results of the Max-Eigen cointegration test show that in the first column, the Max-Eigen Statistic value of 63.90307 is greater than the critical value of 24.15921, and the probability value is less than 0.05, or 0.00. In the second column, the Max-Eigen Statistic value of 45.52901 is greater than the critical value of 17.79730, and the probability value is also less than 0.05, or 0.00. Furthermore, in the third column, the Max-Eigen Statistic value of 34.62326 is greater than the critical value of 11.22480, and the probability is less than 0.05, or 0.00.

**Granger Causality Test Results**

The purpose of this test is to determine the causal relationship between the independent and dependent variables. The grange casualty results are shown in Table 6:

**Table 6.**
**Granger Causality Test**

Dependent variable: D(SSK)

| Excluded | Chi-sq | df | Prob. |
|---|---|---|---|
| D(LOG(P2P)) | 0.040193 | 1 | 0.8411 |
| D(LOG(EMONEY)) | 3.058038 | 1 | 0.0803 |
| D(BIR) | 4.198887 | 1 | 0.0405 |
| All | 7.154174 | 3 | 0.0671 |

Dependent variable: D(LOG(P2P))

| Excluded | Chi-sq | df | Prob. |
|---|---|---|---|
| D(SSK) | 0.085825 | 1 | 0.7696 |
| D(LOG(EMONEY)) | 0.000818 | 1 | 0.9772 |
| D(BIR) | 0.127989 | 1 | 0.7205 |
| All | 0.254230 | 3 | 0.9684 |

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Dependent variable: D(LOG(EMONEY))

| Excluded | Chi-sq | df | Prob. |
|---|---|---|---|
| D(SSK) | 0.969705 | 1 | 0.3248 |
| D(LOG(P2P)) | 4.856531 | 1 | 0.0275 |
| D(BIR) | 0.406539 | 1 | 0.5237 |
| All | 6.577051 | 3 | 0.0867 |

Dependent variable: D(BIR)

| Excluded | Chi-sq | df | Prob. |
|---|---|---|---|
| D(SSK) | 0.008887 | 1 | 0.9249 |
| D(LOG(P2P)) | 0.006032 | 1 | 0.9381 |
| D(LOG(EMONEY)) | 0.131402 | 1 | 0.7170 |
| All | 0.145295 | 3 | 0.9859 |

Source: Processed Data Results using EViews 12 (2025)

a. For the dependent variable, Financial System Stability (SSK), only the interest rate variable has an influence on financial system stability, with a probability value of 0.0405.
b. For the dependent variable P2P, no variable has a causal relationship with the peer-to-peer variable.
c. For the dependent variable E-Money, only the peer-to-peer variable influences E-Money, with a probability value of 0.0275.
d. For the dependent variable, Interest Rate (IR), no variable has a causal relationship with the interest rate variable.

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**The Results of the VECM Estimation Model**

The next step is the estimation of VECM. This is the result:

**Table 7.**
**Long-Term Analysis**

| Variabel | CointEq1 | t-table |
|---|---|---|
| SSK (-1) | 1.00000 | (1.99546) |
| LOG(P2P(-1)) | -0.113709<br>[-1.21341] | |
| LOG(EMONEY(-1)) | 0.160750<br>[ 4.52761] | |
| BIR(-1) | 0.101086<br>[ 0.75841] | |
| C | -4.159920 | |

Source: Processed Data Results using Eviews 12 (2025)
Note: [] = t-statistic significant at $\alpha$ = 5% with df = 68 (1.99546)

Based on the results of the VECM test for the long term, the equation can be formulated as follows:

$$\Delta SSK - 4.159920 - 0.113709\ \Delta P2P_{t-1} + 0.160750\ \Delta EMONEY_{t-1} + 0.101087\ \Delta BIR_{t-1} = 0$$

The equation can be written as follows:

$$\Delta SSK = 4.159920 + 0.113709\ \Delta P2P_{t-1} - 0.160750\ \Delta EMONEY_{t-1} - 0.101087\ \Delta BIR_{t-1}$$

The long-term estimation results show that Peer to Peer (P2P) does not have an effect on Financial System Stability (FSS) with a t-statistic value of -1.21341, which is less than the t-table value of 1.99546. The P2P coefficient is 0.1113709, meaning that a one percent increase in P2P will result in a 0.113709 percent increase in SSK.

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The E-Money estimation results show an effect on FSS in the long term, with a t-statistic value of 4.52761, which is greater than the t-table value of 1.99546. The E-Money coefficient is -0.160750, indicating that for every one percent increase in E-Money, SSK will decrease by -0.160750 percent.

Finally, based on the estimation results, the t-statistic value for the Interest Rate (IR) variable is 0.75841, which is less than the t-table value of 1.99546. This means that IR does not have an effect on FSS in the long term. The IR coefficient is -0.101086, indicating that for every one percent increase in IR, SSK will decrease by -0.101086 percent. The following are the short-term VECM estimation results.

**Table 8.**
**Short-Term Analysis**

| Error Correction: | D(SSK) | t-tabel |
|---|---|---|
| CointEq1 | -0.057686<br>[-1.98702] | (1.99546) |
| D(SSK(-1)) | -0.074440<br>[-0.62885] | |
| D(LOG(P2P(-1)) | 0.000974<br>[0.03769] | |
| D(LOG(EMONEY(-1)) | 0.011960<br>[2.53006] | |
| D(BIR(-1)) | -0.105708<br>[-1.07048] | |

Source: Processed Data using Eviews 12 (2025)

Note: [ ] = t-statistic * significant at $\alpha$ = 5% and degrees of freedom (df) = 68 (1.99546)

Based on the short-term VECM estimation results, the following equation can be formulated:

$$\Delta SSK - 0.057686 CointEq1 - 0.07444\ \Delta SSK_{t-1} + 0.000974\ \Delta P2P_{t-1} + 0.01196\ \Delta EMONEY_{t-1} - 0.105708\ \Delta BIR = 0$$

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The equation can be written as follows:

$\Delta SSK = 0.057686 CointEq1 + 0.07444\ \Delta SSK_{t-1} - 0.000974\ \Delta P2P_{t-1} - 0.01196\ \Delta EMONEY_{t-1} + 0.105708\ \Delta BIR$

Based on the estimation results, it can be seen that the t-statistic value for the P2P variable is 0.03769, which is less than the t-table value of 1.99546. This indicates that the P2P variable has no effect on financial system stability (SSK) in the short term. Next, for the EMONEY variable, the t-statistic value is 2.53006, which is greater than the t-table value of 1.99546. This means that the EMONEY variable does have an effect on SSK in the short term. Furthermore, the estimation results show that the t-statistic value for the BIR variable is -1.07048, which is smaller than the t-table value of 1.99546. In other words, the BIR variable does not affect SSK in the short term.

**Impulse Response Function (IRF) Analysis Results**

The impulse response function (IRF) illustrates how an endogenous variable reacts to a shock in another endogenous variable within a dynamic VAR system. It helps analyze the impact of a one-standard-deviation shock from an innovation variable on the present or future values of endogenous variables.

**Table 9.**
**Impulse Response Function Test Results**

| Response of SSK: Period | SSK | LOG(P2P) | LOG(EMONEY) | BIR |
|---|---|---|---|---|
| 1 | 0.133318 | 0.000000 | 0.000000 | 0.000000 |
| 2 | 0.115640 | 0.001968 | 0.007360 | -0.016012 |
| 3 | 0.104481 | 0.007146 | -0.028124 | -0.021825 |

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| | | | | |
|---|---|---|---|---|
| 4 | 0.101947 | 0.021864 | -0.034982 | -0.032474 |
| 5 | 0.097165 | 0.019632 | -0.047956 | -0.040725 |
| 6 | 0.093887 | 0.028571 | -0.055752 | -0.047704 |
| 7 | 0.091238 | 0.028633 | -0.063183 | -0.053622 |
| 8 | 0.088948 | 0.033202 | -0.068686 | -0.058376 |
| 9 | 0.087176 | 0.034141 | -0.073509 | -0.062347 |
| 10 | 0.085663 | 0.036622 | -0.077249 | -0.065554 |

Source: Processed Data using Eviews 12 (2025)

The test results show that the Financial System Stability (SSK) responds positively and permanently to shocks from the P2P variable from the beginning to the end of the period. The E-Money variable responds positively to shocks in the first and second periods, while in the third period and beyond, it responds negatively. The BIR variable responds negatively to the given shock, although it responds positively in the first period.

**Variance Decomposition (VDC) Analysis Results.**

Variance Decomposition Analysis is used to quantify the contribution of each shock or innovation in a system of equations (usually from a Vector Autoregression, or VAR model) to the forecast error variance of each variable in the model.

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**Table 10.**
**SSK Variance Decomposition (VDC) Results**

| Period | S.E. | SSK | LOG(P2P) | LOG(EMONEY) | BIR |
|---|---|---|---|---|---|
| 1 | 0.133318 | 100.0000 | 0.000000 | 0.000000 | 0.000000 |
| 2 | 0.177372 | 99.00055 | 0.012308 | 0.172201 | 0.814937 |
| 3 | 0.209034 | 96.26331 | 0.125737 | 1.934109 | 1.676844 |
| 4 | 0.238422 | 92.27878 | 0.937611 | 3.639530 | 3.144075 |
| 5 | 0.265762 | 87.63576 | 1.300294 | 6.185337 | 4.878606 |
| 6 | 0.292651 | 82.56389 | 2.025473 | 8.730218 | 6.680420 |
| 7 | 0.318836 | 77.74821 | 2.512951 | 11.28218 | 8.456654 |
| 8 | 0.344668 | 73.19080 | 3.078339 | 13.62577 | 10.10509 |
| 9 | 0.369935 | 69.08736 | 3.523927 | 15.77645 | 11.61226 |
| 10 | 0.394710 | 65.39673 | 3.956278 | 17.68841 | 12.95859 |

Source: Processed Data using Eviews 12 (2025)

Based on the results above, in the first period, the SSK variable is influenced by itself by 100%. The P2P, e-money, and interest rate variables do not yet have any impact on SSK at the beginning of the period. In the second period, the P2P variable contributes 0.012308%, and this contribution increases continuously until the tenth period, reaching 3.956278%. The e-money variable contributes 0.172201% in the second period. Its contribution to SSK continues to increase from the second to the tenth period, reaching 17.68841%. The interest rate variable contributes 0.814937% in the second period, with its contribution to SSK also increasing steadily until the tenth period, reaching 12.95859%.

**Synthesis of the Main Discussion**

**The Effect of Peer-to-Peer (P2P) Lending on Financial System Stability**

The long-term VECM estimation results indicate that Peer-to-Peer (P2P) lending does not have a significant impact on the stability of the financial system.

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Although the growth of P2P lending has continued to rise, the total volume of loans disbursed through P2P platforms is not comparable to the credit extended by banks. The contribution of P2P lending is still relatively small compared to traditional financial sectors such as banking, insurance, or the stock market. The total money circulated through P2P lending platforms has not yet reached a significant level when compared to the volume of credit or investments in the banking or capital markets.

P2P lending may also pose long-term instability risks due to an increased risk of borrower defaults. A rise in default rates can have a negative impact on overall financial stability. Due to these limitations, P2P lending does not yet have a large enough capacity to make a real impact or pose a significant threat to the financial system's overall stability. This is also supported by Saraswati & Tisnawati (2021), who stated that the number of users involved in P2P lending activities, whether as lenders or borrowers, is still relatively small compared to the number of customers in traditional financial institutions such as banks.

**The Effect of E-Money on Financial System Stability**

The long-term VECM estimation results show that e-money has an effect on financial system stability. The greater the amount of electronic money circulating in the economy, the more positive the impact on the financial system's stability. This suggests that increased use of electronic money/payment fintech contributes to more efficient transactions within the economy, thereby boosting overall economic output. The rise in e-money users also indicates improved financial inclusion. E-money accelerates the transaction process, reduces operational costs, is accessible to the unbanked population, and helps minimize the risk of cash loss.

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According to (Lalita et al., 2024), e-money has many advantages, including practicality, efficiency (fast transactions), transaction transparency, ease of use, and reduced risk of losses, theft, and counterfeit money. Due to the convenience and speed offered by electronic money, its usage continues to increase.

**The Effect of Interest Rates on Financial System Stability**

The long-term VECM estimation results indicate that interest rates do not significantly affect financial system stability. This condition occurs because interest rates, although one of the indicators that can influence financial system stability, do not directly determine whether the system remains stable or experiences disruption. Minor changes in interest rates do not yield a significant impact on financial system stability.

Fluctuations in interest rates affect savings and loans: when interest rates rise, people may struggle to repay their loans. An increase in interest rates can also lead to problem loans or Non-Performing Loans (NPL). Therefore, while interest rates can influence financial stability, their impact tends to be indirect.

## CONCLUSION

Based on the research findings, it can be concluded that Peer-to-Peer (P2P) lending has no impact on Financial System Stability (SSK) in either the long term or the short term. E-Money shows a significant influence on FSS in both the long term and the short term. Interest rates do not have any impact on FSS in either the long term or the short term.

For the government, this research can be useful in providing a strong and stable fintech-based financial inclusion ecosystem. Government policy, through the role of the Financial Services Authority (OJK), should focus on monitoring

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P2P fintech lending to minimize default risks. Additionally, a policy that Bank Indonesia can implement is to promote the use of non-cash payment instruments by increasing public awareness of cashless transactions. Further research could include additional variables that reflect the implementation of financial inclusion, fintech development, and supporting factors such as inflation and exchange rates to assess their influence on financial system stability.

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