Al-Kharaj: Journal of Islamic Economic and Business
Volume 8 (2), 2026
P-ISSN: 2686-262X; E-ISSN: 2685-9300

Macroeconomic Determinants of Fintech Lending Disbursement in Indonesia: An ARDL Approach

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Keywords:
Fintech Lending, Macroeconomic Variables, ARDL Model, Industrial Production Index, Lending Disbursement Volume, Indonesia

Abstract

This study aims to evaluate the macroeconomic determinants of fintech lending disbursement volume in Indonesia from January 2021 to August 2025. The variables analyzed include inflation, Outstanding SBSN, money supply (M2), exchange rate, and the Industrial Production Index (IPI). The research employs a quantitative approach using the Autoregressive Distributed Lag (ARDL) model on monthly time series data. Results indicate that the IPI is the sole variable with a significant positive impact on disbursement volume in both the short run and long run. Other monetary variables such as inflation, SBSN, M2, and exchange rates prove to have no statistically significant influence during the observation period. The Error Correction Term (ECT) value of -1.17 confirms a stable cointegration relationship with a very high speed of adjustment toward equilibrium. These findings emphasize that the fintech lending sector in Indonesia is demand-driven and highly dependent on real sector productivity. The growth of this industry is more sensitive to manufacturing performance than to traditional monetary indicator fluctuations. The government is advised to align digital economic policies with the strengthening of the national real industrial sector.

INTRODUCTION

Digital technologies have fundamentally overhauled the global financial architecture through massive automation and system integration. This change changes the way capital is distributed to various economic sectors in a faster, more transparent, and efficient way than conventional methods (Adiningsih, 2025). The most obvious economic impact is the shift in intermediation mechanisms from rigid traditional banking systems to decentralized digital platforms. Digital innovation has successfully eliminated physical barriers such as the need for large branch offices, thereby significantly reducing operational costs. This technology also minimizes information asymmetry issues through the use of advanced algorithms that are often the main obstacle for formal banks in assessing the risk profile of debtors. After the pandemic, digital financial services have transformed into the main instrument to reach the unbanked population. This digitalization allows the fund distribution process to take place flexibly and reach remote areas without dependence on the physical presence of branch office infrastructure (Muryanto et al., 2022).

The main focus of digital economy development in Indonesia is currently explicitly reflected in the growth of fintech lending distribution volume. This variable was chosen because it represents concrete liquidity activities that flow directly to the productive sector, especially MSMEs which are the backbone of the national economy. The distribution of digital financing is considered to be a crucial solution in reducing the financing gap for national MSMEs which is

estimated to still reach Rp1,600 trillion (International Finance Corporation, 2016). This gap, if left unchecked, will hinder the potential for GDP growth and national productivity. In addition, fintech lending expands access to financing for the public and business actors who have been experiencing limited physical collateral such as land or buildings required in the conventional banking system (OJK, 2025). By utilizing alternative credit scores based on digital transaction data, fintech is able to provide more inclusive access to capital. Therefore, the development of fintech lending reflects the vital role of the digital economy in supporting the national financial inclusion program in a sustainable manner.

Although the growth in fintech lending volume in Indonesia shows a very significant trend, the literature linking this development to macroeconomic stability is still relatively limited. Most previous studies have focused more on micro aspects, such as the analysis of user behavior, the level of platform efficiency, and the factors that influence the adoption of technology by individuals (Anshari et al., 2019). In fact, the characteristics of digital finance tend to be much more responsive and volatile to changes in macroeconomic conditions than conventional financial institutions. This is because the process of distributing and withdrawing funds on fintech platforms takes place instantly and based on real-time information technology. In this context, macroeconomic variables such as inflation, exchange rate fluctuations, the availability of the money supply, and the industrial production index are suspected to have a strong influence on the rise and fall of the volume of fund disbursement. As a country that implements a dual financial system, the development of Islamic financial instruments such as State Sharia Securities (SBSN) also has the potential to affect liquidity conditions and investor preferences in the national financial market, which ultimately has an impact on the availability of capital in the fintech sector (Bank Indonesia, 2023).

Based on these dynamics, this study aims to fill the literature gap by comprehensively analyzing the dynamic relationship between macroeconomic variables and Islamic financial instruments on the volume of fintech lending distribution in Indonesia. This study uses the Autoregressive Distributed Lag (ARDL) approach because the method is considered to have technical advantages in identifying short-term and long-term relationships in time series data that have mixed integration levels (Nkoro & Uko, 2016). The ARDL model allows researchers to capture the instantaneous response of distribution volumes to economic shocks without losing important information in the original data. Through this approach, the research is expected to provide a strong empirical picture of how the fintech sector responds to macroeconomic uncertainty. The results of this research are expected to be strategic considerations for regulators, especially the OJK and Bank Indonesia, in formulating digital economy development policies that are in line with efforts to maintain national economic stability in the future.

The theory of financial intermediation explains that financial institutions function as intermediaries between parties who have surplus funds and those who need financing Anthony Saunders & Marcia Millon Cornett (2018) stated that the main function of financial intermediation is to reduce transaction costs and minimize information asymmetry in the process of disbursing funds. In the development of the digital economy, this function is also carried out by sharia fintech lending through the use of technology that emphasizes efficiency, transparency, and ease of access to financing. Digital technology allows the matching process between lenders and lenders to take place faster than conventional banking systems. This condition shows that fintech lending has a strategic role in expanding access to financing in the productive sector and helping to reduce the national funding gap (Amalia & Fitri, 2024).

The sustainability of the digital finance ecosystem is also influenced by macroeconomic conditions. Theoretically, high inflation can reduce the real value of money and weaken people's purchasing power, potentially affecting financing activities (Sucipto, 2021). In addition, State Sharia Securities (SBSN) are Islamic financial instruments that reflect the development of the national Islamic capital market. The existence of SBSN was strengthened through DSN-MUI Fatwa

Number 69/DSN-MUI/VI/2008 as the legal basis for the operation of state Islamic financial instruments (DSN-MUI, 2008). On the other hand, the money supply reflects the level of liquidity in the economy which can affect the financing activities of Islamic financial institutions. Rifai (2017) shows that increased liquidity has a positive relationship with the growth of sharia financing. Meanwhile, the Industrial Production Index (IPI) represents real sector activities and national production levels that can increase working capital needs and financing demand through fintech lending platforms.

From a sharia perspective, fintech lending operations are based on the principles of fairness, transparency, and responsibility in financial transactions. This principle is in line with Islamic teachings regarding the importance of recording and clarity of transactions as explained in the Qur'an Surah Al-Baqarah verse 283. In the modern context, the use of identity verification technology and digital documentation can be seen as an implementation of the principles of prudence and risk mitigation in digital financing transactions. Empirically, Maulana & Wiharno (2022) found that digital financing has a positive contribution to industrial activities and the development of micro businesses. The findings show that fintech lending not only functions as a means of consumptive transactions, but also plays a role in supporting the growth of the real sector through the provision of faster and more flexible liquidity access.

Several previous studies have analyzed the relationship between macroeconomic variables and the development of the fintech sector, but have shown inconsistent results. Research Yahya (2021) shows that real sector activities have a positive relationship with the growth of digital financing and technology-based financial institutions. Meanwhile, Sucipto (2021) found that inflation can put pressure on financing activities through a decrease in people's purchasing power. On the other hand, Haddad & Hornuf (2019) explain that the development of fintech is not always directly influenced by monetary variables, but rather more responsive to the development of real economic activities and technological innovations. In addition, Isa & Suryomurti (2023) show that the sharia fintech sector has a relatively high level of resilience to economic pressures and global market shocks because it is supported by more ethical financial principles and is based on the real sector. The difference in the results of the study shows that the relationship between macroeconomic variables and the volume of fintech lending distribution still requires further empirical testing, especially in the Indonesian context.

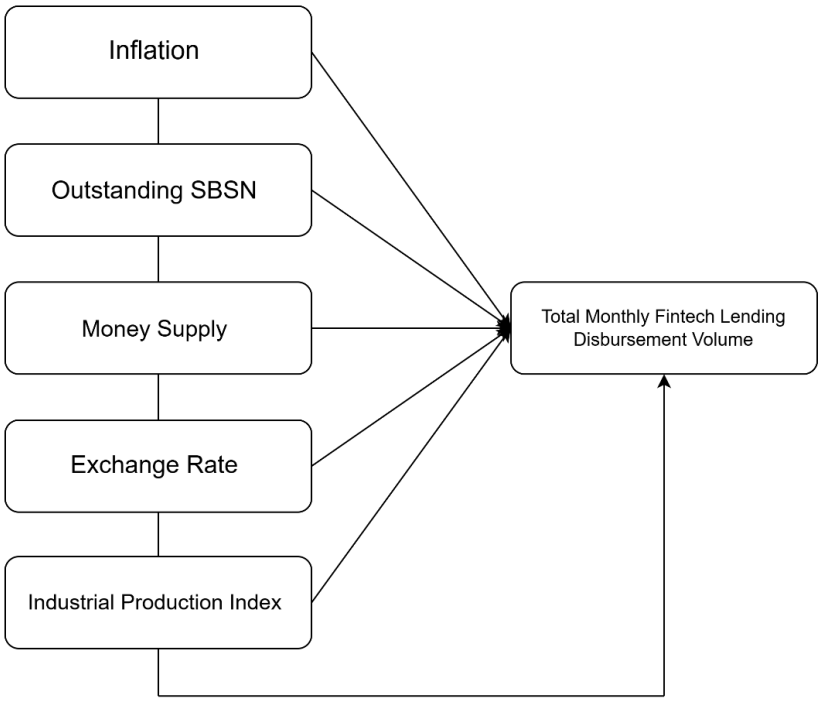


Figure 1. Research Framework

This research framework describes the relationship between macroeconomic variables and Islamic financial instruments to the volume of fintech lending distribution in Indonesia. Inflation, SBSN outstanding, money supply (M2), exchange rate, and Industrial Production Index (IPI) are positioned as independent variables that are theoretically related to digital financial intermediation activities. Price stability, liquidity conditions, and real sector developments are expected to affect the level of financing disbursement on fintech lending platforms. Meanwhile, the volume of fintech lending distribution is used as a dependent variable that represents the development of digital financing activities in Indonesia. The relationship between these variables was then analyzed using the Autoregressive Distributed Lag (ARDL) approach to identify short-term and long-term effects.

METHODS

Method of Research

This study uses a quantitative approach with descriptive and associative research designs. A quantitative approach is used to analyze the relationships between variables through statistical testing and econometric models so as to explain the influence of independent variables on dependent variables (Gujarati & Porter, 2009). This study focuses on analyzing the influence of macroeconomic variables and Islamic financial instruments on the volume of Islamic fintech lending in Indonesia during the 2021–2025 period. The selection of the research period was based on the development of the digital financial sector after the pandemic and the increasing activity of Islamic fintech lending in Indonesia.

Types and Data Sources

The data used in this study is secondary data in the form of a time series with a monthly frequency during the period from January 2021 to August 2025 so that 56 observations were obtained. The research data is sourced from official publications of the Financial Services Authority (OJK), Bank Indonesia through the Indonesian Economic and Financial Statistics (SEKI), the Central Statistics Agency (BPS), and the Directorate General of Financing and Risk Management of the Ministry of Finance of the Republic of Indonesia. The dependent variables in this study are the volume of fintech lending distribution, while the independent variables include inflation, SBSN outstanding, money supply (M2), exchange rate, and Industrial Production Index (IPI).

Research Variables and Operational Definitions

Table 1. Definition of Variable

Variable	Definition	Unit	Source
Volume of Lending Disbursement (VLD)	The volume of sharia fintech lending disbursement in Indonesia	Billion Rupiah	OJK
Inflation (INF)	Monthly inflation rate in Indonesia	Percent(%)	BPS
SBNS	Outstanding State Sharia Securities (*Surat Berharga Syariah Negara*)	Trillion IDR	DJJPR Kemenkeu

Money Supply (M2)	Widespread Money Supply (M2)	Trillion IDR	Bank Indonesia
Exchange Rate (EXC)	Rupiah exchange rate against the US Dollar	Rupiah/USD	Bank Indonesia
Industrial Production Index (IPI)	Industrial Production Index in Indonesia	Index	BPS

Source: Data processed by the author , 2026

Data collection techniques

The analysis method used in this study is Autoregressive Distributed Lag (ARDL) as developed by (Pesaran et al., 2001). The ARDL model was chosen because it is able to identify short-term and long-term relationships in time series data with different levels of integration, as long as the variables are not integrated on order two or I(2). The analysis stage begins with a stationary test using Augmented Dickey-Fuller (ADF) to detect the presence of unit roots and avoid spurious regression (Gujarati, 2004).

Furthermore, the optimal lag is determined based on the smallest Akaike Information Criterion (AIC) value. After that, a Bounds Test is carried out to test the existence of cointegration relationships or long-term balance between research variables. If the results of the Bounds Test show a cointegration relationship, then the estimation is continued using the Error Correction Model (ECM) approach to analyze the dynamics of the short-term relationship and the speed of adjustment towards long-term equilibrium. The dynamic model of ARDL in this study is formulated as follows:

$$VLD_{\mathrm{t}} = \alpha + \sum_{i=1}^{p} \beta_1 \, \Delta VLD_{t-i} + \sum_{i=0}^{q} \beta_2 \, \Delta INF_{t-i} + \sum_{i=0}^{q} \beta_3 \, \Delta SBNS_{t-i} + \sum_{i=0}^{q} \beta_4 \, \Delta M2_{t-i} + \sum_{i=0}^{q} \beta_5 \, \Delta EXC_{t-i} + \sum_{i=0}^{q} \beta_6 \, \Delta IPI_{t-i} + \varepsilon_t$$

Description:

VLD_t= Growth in the Volume of Lending Disbursement

INF_t= Inflation

$SBNS_t$= Outstanding SBNS

$M2_t$= Money supply

EXC_t= Rupiah to USD exchange rate

IPI_t= Industrial Production Index

α= Intercept

β= Regression coefficient

ε_t= Error term

To ensure the robustness of the estimation model, this study also conducted diagnostic tests which included normality, heteroscedasticity, and autocorrelation tests. Based on the research framework, the research hypothesis is formulated as follows:

- **H1**: Inflation is suspected to have a negative effect on the volume of fintech lending distribution in Indonesia.
- **H2**: SBSN is suspected to have an effect on the growth in the volume of lending disbursement fintech lending in Indonesia.
- **H3**: The money supply (M2) is suspected to have a positive effect on the volume of fintech lending distribution in Indonesia.
- **H4**: The exchange rate is suspected to have a negative effect on the volume of fintech lending distribution in Indonesia.
- **H5**: The Industrial Production Index (IPI) is suspected to have a positive effect on the volume of fintech lending distribution in Indonesia.
- **H6**: Inflation, SBSN, money supply, exchange rate, and Industrial Production Index are simultaneously suspected to affect the volume of fintech lending distribution in Indonesia.

.

RESULTS AND DISCUSSION

Result

Descriptive Statistics

Table 2 Descriptive Statistics

	VLD	INF	SBNS	M2	EXC	IPI
Mean	9,889	2,729	13,835	15,928	9,633	151,658
Median	9,906	2,340	13,867	15,937	9,631	154,340
Maximum	10,296	5,950	14,116	16,083	9,728	168,990
Minimum	9,146	-0,090	13,524	15,726	9,552	129,510
Std. Dev	0,287	1,426	0,172	0,098	0,050	8,9219

Source: Data processed by the author using E-Views 12, May 2026

Based on Table 1, the descriptive statistics for the period from January 2021 to August 2025 indicate stable growth in the Volume of Lending Disbursement (VLD). VLD recorded a mean value of 9.889618 with a low standard deviation of 0.287584. These figures reflect the overall resilience of the national fintech industry. In contrast, Inflation (INF) exhibited significant fluctuations, ranging from -0.09 percent to 5.95 percent. Meanwhile, variables such as SBNS, M2, and the Exchange Rate (EXC) remained stable with minimal variation. EXC is identified as the most constant variable in this research.

The Industrial Production Index (IPI) shows the widest distribution, with a mean of 151.6580 and a range between 129.5100 and 168.9900. This dynamic accurately captures actual post-pandemic industrial output conditions. The significant variation in IPI provides an early indication of its influence on digital funding volume, which will be further examined through the ARDL model. Overall, the data characteristics satisfy the fundamental criteria for subsequent short-run and long-run estimation analyses

Unit Root Test Result

The ARDL approach requires that no variables are integrated of the second order or higher. Table 2 summarizes the Augmented Dickey Fuller (ADF) unit root test results at level and first difference for VLD, INF, SBNS, M2, EXC, and IPI. At the level stage, all variables are non stationary as their probability values exceed the 0.05 threshold. However, each variable becomes stationary after the first difference transformation, yielding probability values of 0.0000. These results confirm that all variables are integrated of the first difference, I(1). This outcome strictly complies with ARDL requirements and allows the study to proceed to cointegration testing.

Table 3 Stationarity Test Results at Leveland First Difference

Variable	Level			First Difference		
	ADF	Prob	Intepretation	ADF	Prob	Intepretation
VLD	-2,485	0,124	Not Stationary	-9,259	0,000	Stationary
INF	-1,299	0,623	Not Stationary	-6,544	0,000	Stationary
SBNS	-1,160	0,685	Not Stationary	-7,245	0,000	Stationary
M2	-1,546	0,503	Not Stationary	-6,138	0,000	Stationary
EXC	-1,442	0,555	Not Stationary	-7,123	0,000	Stationary
IPI	-0,985	0,750	Not Stationary	-7,677	0,000	Stationary

Source: Data processed by the author using E-Views 12, May 2026

Cointegration Test Result

Table 3 presents the comparison between the F statistic and critical bounds. At the 5 percent significance level, the F statistic of 4.716232 exceeds the lower bound of 2.39 and the upper bound of 3.38. Consequently, the null hypothesis is rejected. This result confirms that the variables in this study have long run cointegration. These findings indicate that changes in fintech lending volume are influenced by inflation, SBNS, money supply, exchange rate, and the industrial production index.

Table 4 Cointegration Test Bound Test Approach

Test-Statistics	Value	K
F-Statistics	4,7162	5
Critical Value Bounds		
Significance	**Lower Bound(0)**	**Upper Bound(1)**
10%	2,08	3
5%	2,39	3,38
2,5%	2,7	3,37
1%	3,06	4,15

Source: Data processed by the author using E-Views 12, May 2026

Diagnostic Tests

Table 4 presents the classical assumption test results to ensure the validity and reliability of the ARDL model in this study. The normality test using the Jarque-Bera method yields a probability value of 0.959495. Since this value exceeds the 0.05 threshold, the residuals are confirmed to be normally distributed. The autocorrelation test produces a probability value of 0.6798, indicating that the model is free from serial correlation issues. Furthermore, the heteroscedasticity test results show a probability value of 0.1387, proving the absence of variance problems. Overall, the diagnostic results in Table 4 confirm that the model meets all classical assumption requirements and is robust for subsequent analysis.

Short-Term and Long-Term Estimation Results

Table 5 ARDL Estimation Result

Short Run Result				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D(VLD(-1))	-0,171	0,121	-1,411	0,164
D(INF)	-4,398	0,023	-0,001	0,998
D(SBNS)	-0356	0,390	-0,913	0,365
D(M2)	0,23	0,935	0,246	0,806
D(EXC)	0,085	0,592	0,143	0,886
D(IPI)	0,004	0,001	4,531	0,000
CointEq(-1)*	-1,171	0,0947	-12,373	0,000
Long Run Result				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D(INF)	-3,750	0,0197	-0,001	0,998
D(SBNS)	-0,304	0,339	-0,898	0,373
D(M2)	0,196	0,797	0,246	0,806
D(EXC)	0,072	0,506	0,143	0,886
D(IPI)	0,004	0,001	3,959	0,000
C	0,020	0,010	1,942	0,058

Source: Data processed by the author using E-Views 12, May 2026

Table 5 presents the results of the ARDL model estimates to examine the dynamics of the variables over both the short and long term. In the short term, the Industrial Production Index (IPI) was found to have a significant positive impact on Loan Disbursement Volume (VLD), supported by a p-value of 0.0000. Meanwhile, other supporting variables such as inflation, SBNS yields, money supply (M2), and the exchange rate show no statistically significant influence in the short term. Another critical component, coefficient CointEq(-1) at -1.171809, indicates strong significance at the 1 percent level. This figure not only proves the existence of a long-term cointegration relationship but also reflects a highly responsive adjustment speed toward the equilibrium point, as its absolute value exceeds 1. This means the model is very quick to correct deviations caused by economic fluctuations to return to its long-term trend.

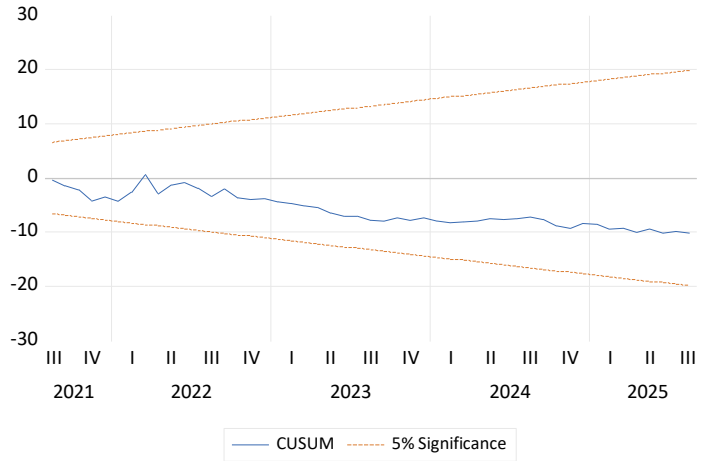
In the longer term, the Industrial Production Index (IPI) has consistently been the only significant fundamental variable affecting Loan Disbursement Volume (VLD). With a coefficient of 0.004223 and a probability of 0.0003, there is strong evidence that increased activity in the

industrial sector will be accompanied by persistent growth in fintech sector funding. Specifically, a 1-unit increase in the IPI is projected to permanently increase loan disbursement by 0.0042 units. Conversely, other macroeconomic variables continue to show no significant influence on the long-term structure during the study period. These results provide strong indications that the sustainability of the fintech lending industry in the context of this study depends far more on the health of real sector productivity than on fluctuations in monetary indicators.

Stability Test Results

The CUSUM test in this study was conducted based on the cumulative sum of the recursive residuals from the first observation. As long as the statistical plot generated by CUSUM remains within the 5% confidence interval, the results of the estimated coefficient test are considered stable.

Table 6 Cusum Test Result



Source: Data processed by the author using E-Views 12, May 2026

Based on the results obtained from the CUSUM test above for the equation model in this study, it was found that the cumulative sum of recursive residuals and the cumulative sum of quadratic residue curves did not exceed the critical value at a 5% significance level. In this case, it can be concluded that the equation model in this study is in a stable state.

DISCUSSION

The results of the study show that the Industrial Production Index (IPI) is the only variable that has a significant influence on the growth in the volume of lending disbursement fintech lending sharia in Indonesia. These findings indicate that the development of fintech lending is more influenced by real sector activities than other macroeconomic conditions. The increase in industrial activity reflects the expansion of production and the increasing need for working capital, especially for MSME actors who are the main users of fintech lending services. In these conditions, fintech lending is an alternative financing that is able to meet business needs quickly and flexibly.

The positive relationship between IPI and fintech lending shows that the growth of digital financing in Indonesia is demand-driven, driven by the increasing financing needs of the business sector. When production activities increase, business actors tend to need additional funds to maintain production, distribution, and business operational capacity. This finding is in line with

research by Maulana and Wiharno (2022) who stated that digital financing is related to increasing economic activity and national industrial output.

Meanwhile, the inflation variable does not show a significant influence on fintech lending. This finding is different from the research of M Zaki As Shafi (2025) who stated that macroeconomic indicators and monetary policy have an influence on the growth of Islamic fintech in Indonesia. The difference in results is suspected to be caused by differences in the research period and the characteristics of the dependent variables used. In this study, Islamic fintech lending during the post-pandemic period tends to be more influenced by the financing needs of the real sector than changes in price levels in general.

In the outstanding SBSN variable, the results of the study show that there is no significant influence on the volume of fintech lending distribution. This condition indicates that the increase in State Sharia Securities instruments does not directly affect digital financing activities. The investor segment in SBSN instruments and fintech lending users are suspected to have different characteristics so that there is no direct substitution effect on fintech lending liquidity. This finding is not entirely in line with Winarto & Beik (2024) who stated that Islamic monetary instruments are related to financing in the Islamic financial system. However, studies on the relationship between SBSN and Islamic fintech lending are still relatively limited, so the empirical results obtained have not shown strong consistency.

Furthermore, the money supply (M2) also did not show a significant influence on fintech lending. These findings are not entirely in line with monetary theories that increased liquidity can drive financing growth. The results of this study are also different from research Rifai (2017) which found a relationship between monetary indicators and the development of Islamic fintech. However, in the context of this study, the development of fintech lending is more influenced by technological factors, ease of digital access, and high business financing needs than monetary liquidity conditions in aggregate.

The rupiah exchange rate against the United States dollar also did not show a significant influence on the volume of fintech lending distribution. These results show that fintech lending activities in Indonesia are still more oriented towards the domestic market and relatively insensitive to exchange rate fluctuations. The majority of financing transactions are carried out in rupiah, so exchange rate changes have not had a direct impact on the growth of fintech lending during the research period. These findings are not entirely in line with Haddad and Hornuf (2019) which states that the development of fintech is influenced by macroeconomic conditions and financial system stability.

In addition, the results of the Error Correction Term (ECT) estimation which are negative and significant shows that there is an adjustment mechanism towards long-term equilibrium after a short-term disturbance. The stability of the model is also strengthened through the CUSUM test which shows that the research model is within the stability limit so that the estimation results are considered consistent and able to explain the relationship between variables in this study.

CONCLUSION

This study concludes that the Industrial Production Index (IPI) is the single dominant determinant in influencing the volume of fintech lending distribution in Indonesia. These findings hold consistently in both short-term and long-term time frames. The increase in productivity in the manufacturing industry sector is proven to create a real demand for funding for digital platforms.

In contrast, other macroeconomic variables such as inflation, outstanding SBSN, money supply (M2), and exchange rate did not have a significant influence individually on the volume of distribution. This phenomenon shows that the fintech lending ecosystem in Indonesia is more demand-driven driven by real sector activities than supply-driven driven by monetary policy alone. The research model also shows a high level of resilience with a correction mechanism towards a long-term equilibrium that takes place very quickly. This confirms that the fintech sector has a strong ability to adapt to economic shocks to stay on its growth trend. The growth of digital loan distribution is currently in line with Islamic finance principles that emphasize productive activities in the real sector.

The government and the Financial Services Authority need to synergize the fintech industry development policy with the real industrial sector growth strategy. Policy focus should be directed to strengthening the national production ecosystem because this is the main driving force for demand for digital funding. Exchange rate stability and inflation still need to be maintained as a prerequisite for a healthy ecosystem even though the impact is not directly visible on the current disbursement volume. For the next researcher, it is recommended to explore other variables that have not been included in this model, such as foreign direct investment or international trade policy. The use of more diverse research methods such as the Vector Error Correction Model (VECM) or a qualitative approach through the case studies of specific fintech companies can provide additional in-depth insights. Future researchers can also dissect the influence of financing on more specific sectors of the manufacturing industry to see the heterogeneity of the impact of digital funding. The extension of the observation period will also be very beneficial to ensure the consistency of these findings amid the ever-changing dynamics of the global economy.

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