

Analysis of Financial Inclusion and Literacy in Reducing Poverty Levels in Indonesia

Antonius Gulo, Bakhtiar Efendi, Suhendi, Lia Nazliana Nasution, Rusiadi

Abstract

This study aims to analyze the effect of payment systems, financial inclusion, and financial literacy on economic growth and poverty levels in Indonesia. This study uses secondary data for the period 2015–2025 and applies a simultaneous equation model approach. The variables used in this study consist of Financial Literacy (LIT), Payment System (SP), Financial Inclusion (INK), Economic Growth (PE), and Poverty (KEM). The results of the first equation estimation show that financial literacy, payment systems, and poverty do not have a significant effect on economic growth at the 5% significance level. The first equation model has an R-squared value of 71.58%. In the second equation, the payment system has a negative and significant effect on poverty with a probability value of $0.0017 < 0.05$, while financial inclusion and economic growth have a negative but insignificant effect. The second equation model has an R-squared value of 97.01%, indicating that the independent variables are able to explain most of the variation in poverty levels. The development of payment systems in Indonesia showed an increasing trend during the research period, although it experienced a decline in 2020 due to the COVID-19 pandemic and recovered to reach 2.89 million in 2025. The findings indicate that the payment system is a significant factor in reducing poverty in Indonesia. Meanwhile, financial literacy and financial inclusion have not shown significant effects on economic growth and poverty during the research period. This indicates that improvements in financial access and knowledge need to be accompanied by more productive utilization in order to generate greater economic impacts.

Keywords: *Financial Inclusion, Financial Literacy, Economic Growth, Payment System, Poverty*

¹ Antonius Gulo

¹ Master of Ekonomi, Universitas Pembangunan Panca Budi, Indonesia

e-mail: guloantonius52@gmail.com

^{2,3,4,5} Bakhtiar Efendi, Suhendi, Lia Nazliana Nasution, Rusiadi

^{2,3,4,5} Master of Ekonomi, Universitas Pembangunan Panca Budi, Indonesia

e-mail: koneksisaya@gmail.com, suhendi@dosen.pancabudi.ac.id, lianazliana@dosen.pancabudi.ac.id, dekan.fasosa@pancabudi.ac.id

3rd International Conference on the Epicentrum of Economic Global Framework (ICEEGLOF)

Theme: Navigating The Future: Business and Social Paradigms in a Transformative Era.

<https://proceeding.pancabudi.ac.id/index.php/ICEEGLOF>

Introduction

Poverty is a multidimensional problem that is not only related to a lack of income, but also includes limitations in accessing education, health services, employment, capital, information, and opportunities to determine one's own life. Poverty can arise from low income, limited employment opportunities, slow economic growth, low levels of education, and limited access to means of production and financial resources (Suryawati, 2005). These conditions cause people to experience difficulties in meeting basic needs such as food, clothing, shelter, education, and health. Poverty can also affect various aspects of people's lives and become one of the problems that hinder the process of development and economic growth (Suparlan, 1995).

In a broader sense, poverty reflects the inability of an individual or group to meet various life needs. Primary poverty is characterized by limited asset ownership, low participation in social and political organizations, and limited knowledge and skills. Secondary poverty, on the other hand, is characterized by weak social networks, limited financial resources, and limited access to information. These conditions can be observed through various indicators, such as the lack of clean water, malnutrition, low levels of education, high unemployment, and the community's limited ability to access basic services.

The problem of poverty has become a concern for the international community, especially in developing countries. The United Nations has set poverty eradication as one of the priorities in the Sustainable Development Goals (SDGs) program, which is targeted to be achieved by 2030. The program includes 17 development goals, including no poverty, no hunger, health and well-being, quality education, gender equality, clean water and sanitation, clean and affordable energy, economic growth and decent work, industry and innovation, reducing inequality, and partnerships to achieve development goals (Sutopo, 2014). Placing poverty eradication as the first goal shows that poverty is closely related to the achievement of various other dimensions of development.

In Indonesia, poverty remains a development issue that requires ongoing attention. According to 2026 Statistics Indonesia (BPS) data, the number of poor people in 2015 reached 28.59 million, or 11.22 percent. This number decreased to 24.79 million, or 9.22 percent, in 2019. However, in 2020, the number of poor people increased again to 27.55 million, or 10.19 percent. This increase indicates the vulnerability of the community's socioeconomic conditions to economic changes and pressures. From 2021 to 2023, the number of poor people decreased again, from 26.50 million, or 9.71 percent, in 2021 to 25.90 million, or 9.36 percent, in 2023. Despite showing a downward trend, the number of poor people remains relatively large and demonstrates that poverty reduction requires more comprehensive and sustainable policies.

One approach that can be used to support poverty reduction is increasing financial inclusion and literacy. Financial inclusion provides opportunities for people to obtain and use various financial products and services, such as savings, credit, insurance, and payment facilities. Meanwhile, financial literacy relates to people's knowledge, skills, and abilities in making decisions and managing their finances appropriately. From an educational perspective, improving financial literacy is part of the community's learning process, enabling them to understand the benefits, costs, and risks of financial products and to use financial services for productive activities. However, the availability of financial access is not always accompanied by the community's ability to utilize these services to increase income and well-being.

Developments in financial technology and payment systems have also transformed people's economic transaction patterns. Easier, faster, and more widespread payment systems can improve transaction efficiency, expand economic activity, and open public access to formal

financial services. The use of digital payment systems also has the potential to reduce geographic barriers and transaction costs, especially for communities that have previously lacked adequate financial services. However, increased use of payment systems, financial inclusion, and financial literacy do not necessarily directly result in inclusive economic growth or poverty reduction. Their impact depends heavily on equitable access, the quality of financial education, the public's ability to use services productively, and the distribution of the benefits of economic growth.

Yoko Tristiarto and Wahyudi's (2022) research, "Analysis of Financial Literacy and Financial Inclusion: Financial Technology on Personal Finance of Small and Medium Enterprises in Lebak Regency, Banten," shows that financial literacy influences personal finance. Financial literacy helps small and medium enterprises make better financial decisions. The study also found that financial inclusion has a significant, albeit relatively weak, influence on personal finance. The development of financial technology provides convenience and speed for business actors in obtaining and using financial services. However, the study focused on the financial management of small and medium enterprises within a specific region using the Partial Least Square (PLS) method.

Based on previous research, there remains a gap in research regarding the relationship between financial inclusion, financial literacy, payment systems, economic growth, and poverty at the national macroeconomic level. Previous research has focused more on analyzing the influence of financial literacy, inclusion, and technology on the financial behavior or management of individuals and businesses. Meanwhile, the relationship between financial components, economic growth and poverty is reciprocal, making it inadequate to analyze using only a single regression equation. Therefore, research is needed that positions economic growth and poverty as endogenous variables within a system of interrelated equations.

The scientific novelty of this study lies in the use of a simultaneous equation model to analyze the relationship between financial literacy, financial inclusion, payment systems, economic growth, and poverty in Indonesia during the 2015–2025 period. The first equation analyzes the influence of financial literacy, payment systems, and poverty on economic growth. The second equation analyzes the influence of financial inclusion, payment systems, and economic growth on poverty. The use of this model allows the study to explain the direct and reciprocal relationships between variables more comprehensively than studies using only one equation.

The scientific challenges in this research are the unclear ability of increasing financial inclusion to drive economic growth and reduce poverty, the impact of payment systems on economic growth and poverty, and the impact of financial literacy on economic growth in Indonesia. Furthermore, economic growth does not necessarily automatically reduce poverty if its benefits are not distributed evenly to low-income groups.

Based on these issues, this study aims to analyze the influence of payment systems, financial inclusion, and financial literacy on economic growth and poverty levels in Indonesia. It also aims to explain the simultaneous relationship between economic growth and poverty, thus providing a scientific basis for developing payment system policies, financial literacy education programs, expanding financial inclusion, and more inclusive economic growth strategies.

Literature Review

2.1. Theoretical basis

This research positions poverty as a grand theory, economic growth as a middle theory, and financial inclusion, financial literacy, and payment systems as applied theories. This structure is used to explain poverty as a macro issue influenced by economic development and the public's ability to access, understand, and use financial services.

2.2. Poverty

Poverty is a condition where a person is unable to meet basic needs such as food, clothing, shelter, education, and healthcare. This condition can be caused by a scarcity of means to meet basic needs and limited access to education and employment (Jonaidi, 2012). Poverty is also a global problem that can be understood subjectively, comparatively, morally, evaluatively, and scientifically (Solikatun, 2018).

According to the Coordinator for People's Welfare of the Republic of Indonesia (2000), poverty is a state of deprivation experienced by an individual or group of individuals beyond their control and caused by various complex, interacting factors. According to the National Population and Family Planning Agency (2002), poverty is indicated by a family's inability to meet the needs of worship, food, clothing, housing conditions, and health services.

Based on its form, poverty consists of subjective, absolute, relative, natural, cultural, and structural poverty. Subjective poverty is based on a person's assessment of their needs; absolute poverty indicates income below the poverty line; relative poverty occurs because development has not reached all of society; natural poverty is caused by limited natural resources; cultural poverty is related to attitudes and habits; while structural poverty occurs when the social system is unable to connect society with available resources.

The National Family Planning Coordinating Board (BKKBN) measures poverty based on the criteria for Pre-Prosperous Families and Prosperous Families I (Suryawati, 2005). According to the Central Statistics Agency (2014), poverty is measured using the concept of the ability to meet basic needs or the basic needs approach. The indicators include the Head Count Index (P0), Poverty Gap Index (P1), and Poverty Severity Index (P2) with the formula:

$$P_{\alpha} = \frac{1}{N} \sum_{i=1}^N \left(\frac{z - y_i}{z} \right)^{\alpha}$$

Where :

- Z = line poverty
- I = average per capita expenditure of the population below the poverty line.
- Q = many residents are below the poverty line
- N = total population
- α = 0,1,2

$\alpha = 0$ = Head Count Index (P0)

$\alpha = 1$ = Poverty Gap Index (P1)

$\alpha = 2$ = Poverty Severity Index (P2)

Head Count Index(P₀) shows the percentage of the population below the poverty line, the Poverty Gap Index (P1) shows the gap in the average expenditure of the poor population to the poverty line, while the Poverty Severity Index (P2) describes the distribution of expenditure among the poor population. The poverty line consists of a food poverty line equal to 2,100 kilocalories per capita per day and a non-food poverty line that includes housing, clothing, education, and health.

According to Hartomo and Azis and Dadan Hudyana (2009:28-29), the causes of poverty include low education, laziness to work, limited natural resources, employment opportunities, capital, and large family burdens. Suryadiningrat in Dadan Hudyana (2009:30) also states that poverty is related to reluctance to work and strive, ignorance, low motivation, lack of long-term planning, a culture of poverty, and a misconception about poverty. These factors indicate that poverty is related to limited abilities, economic opportunities, and access to resources.

2.3. Financial Inclusion

Based on Financial Services Authority Regulation Number 76/POJK.07/2017 concerning Increasing Financial Literacy and Inclusion in the Financial Services Sector for Consumers and the Community, financial inclusion is the availability of access to financial institutions, products, and services according to the needs and capabilities of the community.

The Consultative Group to Assist the Poor, in its 2017 National Financial and Infrastructure Program (SNLKI), defines financial inclusion as household and business access to effective, sustainable, and regulated financial products and services. According to the Center for Financial Inclusion, financial inclusion encompasses access to quality, convenient, affordable, and tailored credit, savings, insurance, and payments that address consumer protection.

The Indonesian National Society for Financial Inclusion (SNLKI) (2017) defines financial inclusion as access to beneficial, affordable, responsible, and sustainable transaction, payment, savings, credit, and insurance products and services. Elements of financial inclusion include access, availability, use, and quality of services. Financial literacy and access to financial services also influence people's ability to manage their finances, invest, prepare for education, and meet long-term needs.

The basic principles of financial inclusion in the SNLKI (2017) include measurability, affordability, targeted effectiveness, and sustainability. Based on Financial Services Authority Regulation No. 76/POJK.07/2017 concerning Improving Financial Literacy and Inclusion in the Financial Services Sector for Consumers and the Public, the goal is to improve access, provision, use, and quality of financial products and services.

In its development, Presidential Regulation Number 82 of 2016 concerning the National Strategy for Financial Inclusion established six pillars: financial education, public financial facilities, financial information mapping, supporting policies or regulations, intermediation facilities and distribution channels, and consumer protection. These pillars are supported by conducive policies and regulations, financial information technology infrastructure, and effective organizations and implementation mechanisms. Financial inclusion is expected to expand access to capital, savings, transactions, and risk protection, thereby increasing income and reducing poverty.

2.4. Financial Literacy

Based on Financial Services Authority Regulation Number 76/POJK.07/2016 concerning Increasing Financial Literacy and Inclusion in the Financial Services Sector for Consumers and the Community, financial literacy is knowledge, skills, and beliefs that are influenced by attitudes and behavior to improve the quality of decision-making and financial management.

According to the SNLKI (2017), financial literacy encompasses knowledge and understanding of financial concepts and risks, as well as the skills, motivation, and confidence to make effective decisions. Without adequate financial literacy, people may experience difficulty selecting savings or investment products and are more vulnerable to the risk of fraud.

The basic principles of financial literacy in the SNLKI (2017) include planning and measurement, achievement-oriented, sustainable, and collaborative. Based on Financial Services Authority Regulation No. 76/POJK.07/2017 concerning Improving Financial Literacy and Inclusion in the Financial Services Sector for Consumers and/or the Community, financial literacy aims to improve the quality of financial decisions and improve public attitudes and behavior in managing finances.

The Financial Services Authority (OJK) emphasizes that financial education is necessary to enable the public to manage their finances intelligently and avoid being easily deceived by investment products that offer high returns without considering the risks. According to Chen and Volpe (1998), financial literacy encompasses four aspects: basic financial knowledge, savings and loans, insurance, and investment.

Financial literacy is beneficial in helping people choose products according to their needs, plan their finances, avoid unclear instruments, and understand the benefits and risks of financial services. To support this, the Financial Services Authority (OJK) has established three pillars of the national literacy strategy: national education and campaigns, strengthening financial literacy infrastructure, and developing affordable financial products and services. Thus, financial literacy can strengthen the productive use of financial services and support economic growth.

2.5. Payment system

The payment system is an integral part of a country's financial and banking system. This system encompasses the regulations, contracts, operational facilities, and technical mechanisms used to deliver, validate, and receive payment instructions. Generally, the payment system consists of a large-value payment system (LVA) and a retail payment system (Retail Payment System) (Untoro, 2014).

In Law No. 23 of 1999 BI article 1 point 6 it is explained that the payment system includes a set of rules, institutions, and mechanisms for transferring funds to fulfill obligations arising from economic activities. According to Muttaqin in Purusitawati (2000), the payment system also includes laws, standards, procedures, technical mechanisms, payment instruments, banks, clearing houses, intermediary institutions, and the central bank. According to Law No. 3 of 2004 concerning Bank Indonesia, Bank Indonesia is authorized to regulate and maintain the smooth operation of the payment system and determine the use of payment instruments to ensure security and efficiency.

The development of payment systems ranges from barter, commodity money, coins, fiat money, checks, to electronic payments. According to Muttaqin in Miskhin (2011), fiat money is paper money established by the government as a means of transaction to replace gold and silver. According to Listfield and Montes (1994), barter, gold, silver, and fiat money are simple and widely used forms of cash payment, especially in developing countries. Money functions as a medium of exchange, a unit of account, and a store of value.

To maintain the quality of currency in circulation, Bank Indonesia issues new currency and provides public education on the characteristics of authentic rupiah (Bank Indonesia, 2006). However, the use of fiat currency incurs security, transportation, and transaction costs and relies on public trust in the issuing institution (Miskhin, 2001).

According to Muttaqin in Purusitawati (2000), the limitations of cash and check payments have encouraged the development of electronic payments supported by computer technology. Listfield and Montes-Negret (1994) explain that electronic payments are effective for high-volume transactions with relatively small values. Cash payment instruments use fiat money, while non-cash payments use cards, checks, giro bills, debit notes, electronic money, BI-RTGS, and the National Clearing System provided by Bank Indonesia's payment system. An efficient payment system can speed up transactions, reduce costs, expand financial inclusion, and support community economic activities.

2.6. Previous Research

Previous research was used to examine differences in methods, variables, and research findings regarding financial inclusion, economic growth, and poverty. A summary of previous research is presented in Table 1.

Table 1.Previous Research

No	Identity Year	Title	Method	Variables	Results
1	Iwan Rhamadani, 2021	Analysis of the Impact of Financial Inclusion and Poverty in Indonesia	Panel data regression	Financial Inclusion, Poverty, Penetration, Availability, Usage, GRDP, Panel Data	Based on research that has been conducted to see the effect of financial inclusion on poverty with a case study in Indonesia in 2007–2018 using the Panel Data method, it can be concluded that financial inclusion has an effect on poverty. Of the three financial inclusion variables, only two variables have a significant negative effect on poverty, namely the availability variable and the usage variable. Meanwhile, one variable from financial inclusion, namely the penetration variable, does not have a significant effect on poverty. In addition, the GRDP variable also does not have a significant effect on poverty. The reasons for the two insignificant variables have been explained in the related section. The research findings above show that financial inclusion has an important role in reducing poverty levels in Indonesia.
2	Denni Setiawan Jayadi, Aloysius Gunadi Bata, 2016	The Role of Economic Growth in Reducing Poverty at the Provincial Level in Indonesia 2004-2012.	Panel data regression	Fixed Effect, Poverty, Sectoral GRDP, Economic Growth, Commodities Boom	Based on the estimation results, overall economic growth has a negative and significant impact on poverty at the provincial level in Indonesia. Furthermore, from a sectoral perspective, the mining sector has a negative and significant impact on poverty reduction. This is due to the commodities boom in mining commodities.

					Therefore, the mining sector is not a key sector in poverty reduction, but the commodities boom has an impact on poverty reduction in Indonesian provinces.
3	Vania Grace Sianturi, M. Syafii, and Ahmad Albar Tanjung, 2021	Analysis of poverty determinants in Indonesia case study 2016-2019.	Panel data regression	Poverty, Population Growth Rate, Human Development Index, Economic Growth, Income Distribution Inequality, and Unemployment Rate.	The results of the study based on the panel data regression analysis method show that the population growth rate, human development index, economic growth, income distribution inequality and unemployment rate have a simultaneous effect on poverty. Partially, the population growth rate has a positive and significant effect on poverty, the human development index has a negative and significant effect on poverty, economic growth has a negative and insignificant effect on poverty, income distribution inequality has a negative and insignificant effect on poverty and the unemployment rate has a positive and insignificant effect on poverty.
4	Mahardhi Arif 2019	The Impact of Financial Inclusion on Poverty Levels in Indonesia.	Panel data regression	Poverty, GRDP, Inflation, Financial Inclusion, Education Level, Population, and Trade.	The research results show that Indonesia has a very high level of financial inclusion. Furthermore, the level of financial inclusion in Indonesia's 33 provinces has a significant impact on poverty reduction.

Source: Author, 2026

Table 1 shows that financial inclusion plays a role in poverty reduction, primarily through the availability and use of financial services. However, the effect of economic growth on poverty shows mixed results. Denni Setiawan Jayadi and Aloysius Gunadi Bata (2016) found a negative and significant effect, while Vania Grace Sianturi, M. Syafii, and Ahmad Albar Tanjung (2021) found a negative but insignificant effect.

Previous research generally used panel data regression and analyzed one-way relationships. This study differs by incorporating financial literacy, financial inclusion, payment systems, economic growth, and poverty into a simultaneous equation model, allowing for a reciprocal analysis of the relationship between economic growth and poverty.

2.7. Conceptual Framework

The conceptual framework illustrates the relationships between variables and serves as a guideline for developing research models. Financial literacy is expected to improve people's ability to make decisions regarding savings, financing, and investment, thereby supporting economic growth. Financial inclusion provides access to financial products and services that can increase income and reduce poverty, while payment systems speed up transactions and reduce economic costs.

Economic growth and poverty are interconnected. Economic growth can reduce poverty by increasing income, employment opportunities, and business activity. Conversely, high levels of poverty can limit productivity, access to education and capital, and people's ability to participate in economic activities.

2.8. Framework of Thinking

Based on theoretical foundations and previous research, the relationship between financial literacy, financial inclusion, payment systems, economic growth, and poverty is structured into a conceptual framework. This framework demonstrates that increased financial knowledge and access, as well as the development of payment systems, can influence economic growth and poverty levels in Indonesia. The relationships between these variables are presented in Figure 1.

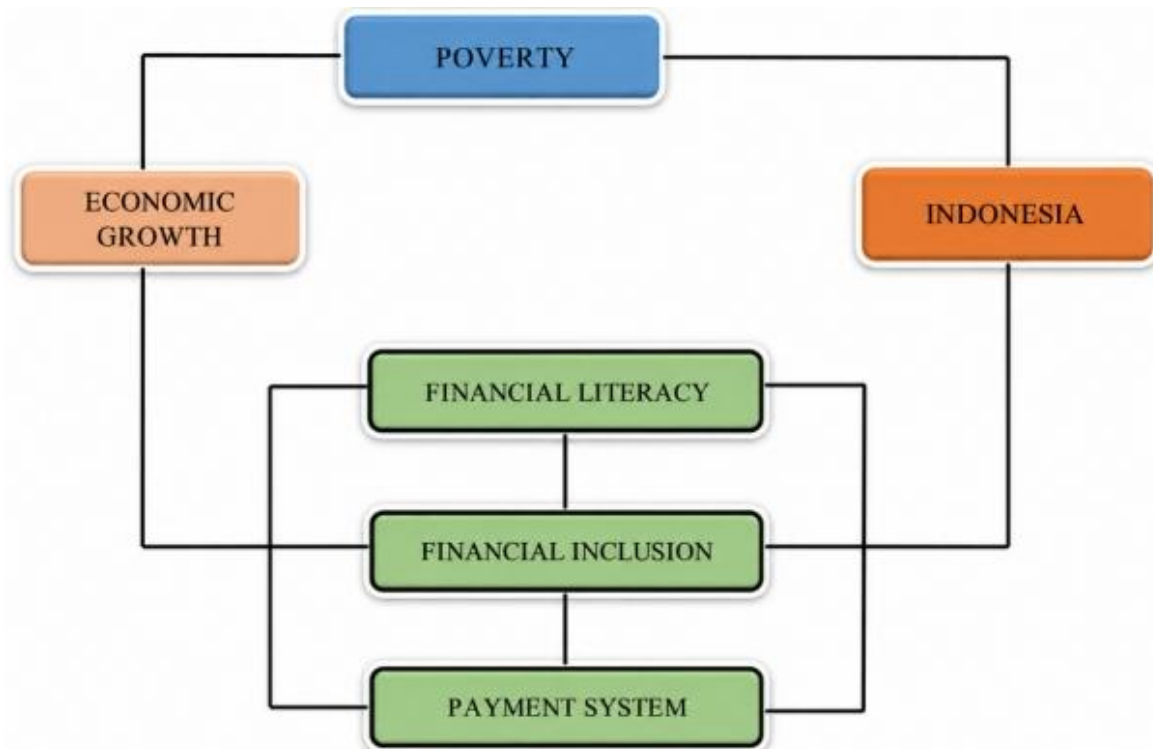


Figure 1. A Framework for Thinking on the Analysis of Inclusion and Financial Literacy in Reducing Poverty Levels in Indonesia

Source: Author, 2026

Figure 1 shows the general relationship between Indonesia's economic conditions, economic growth, and poverty. This framework serves as a basis for analyzing the role of financial literacy, financial inclusion, and payment systems in supporting economic growth and reducing poverty.

2.9. Hypothesis

A hypothesis is a tentative assumption regarding the relationship between variables, based on theoretical foundations, previous research findings, and a conceptual framework. The hypothesis is then empirically tested to determine the influence of financial literacy, financial inclusion, payment systems, economic growth, and poverty in Indonesia. The research hypothesis is formulated as follows:

1. H1: Good financial inclusion can increase economic growth thereby reducing poverty levels.
2. H2: Payment systems can have an impact on economic growth.
3. H3: Financial inclusion and financial literacy have a significant impact on economic growth and poverty.
4. H4: Economic growth has a significant effect on poverty.

Methods

3.1 Research Approach

This study uses a quantitative associative approach to determine the relationship and patterns of influence between two or more variables. This approach can be used to build theories that explain, predict, and control phenomena (Rusiadi, 2017). The analysis was conducted using a simultaneous equation model because economic growth and poverty are reciprocally related and are considered endogenous variables.

3.2 Data and Variables

The research was conducted within Indonesia using annual secondary data from the Central Statistics Agency (BPS) and Bank Indonesia for the 2015–2025 period. The research variables included poverty, economic growth, financial inclusion, financial literacy, and payment systems.

The data collection technique used a documentation study with a library approach. According to Sugiyono (2009), data collection techniques are a strategic step in research because they aim to obtain the information needed to answer problems and empirically prove hypotheses. Literature studies are used to enrich understanding of the concepts that form the basis of the research (Martono, 2011). The research instrument is secondary data documentation used to record, group, and process data for each variable.

Operational definitions are needed to explain the concept, measurement, and scale of each variable. The variables used in the study are presented in Table 2.

Table 2.Operational Definition of Variables

No	Variables	Definition	Measurement	Scale
1	Poverty	A condition where a person or group is unable to meet their needs.	Percent	Ratio
2	Economic growth	Continuous changes in a country's economic conditions towards a better situation over a certain period.	Percent	Ratio
3	Financial Inclusion	Access to useful and affordable financial products and services to meet the needs of the community and its business activities, including transactions, payments, savings, credit, and insurance that are used responsibly and sustainably.	Percent	Ratio
4	Financial Literacy	Skills in decision making and financial management to achieve community financial well-being.	Percent	Ratio
5	Payment system	The system used in the payment process.	Million	Ratio

Source: Processed by the author, 2026

Based on Table 2, economic growth and poverty are endogenous variables because they have a reciprocal relationship in the system of equations. Financial literacy, financial inclusion, and payment systems are used as explanatory variables according to the equations formed. The payment system measurement is adjusted to millions because the data used in the research results are expressed in millions, not percentages.

3.3 Simultaneous Method Framework

A simultaneous equation model is used to explain the reciprocal relationship between economic growth and poverty. Financial literacy is estimated to influence economic growth, while financial inclusion is estimated to influence poverty levels. The payment system is positioned as a variable that can influence economic growth and poverty. The relationship between these variables is presented in Figure 2.

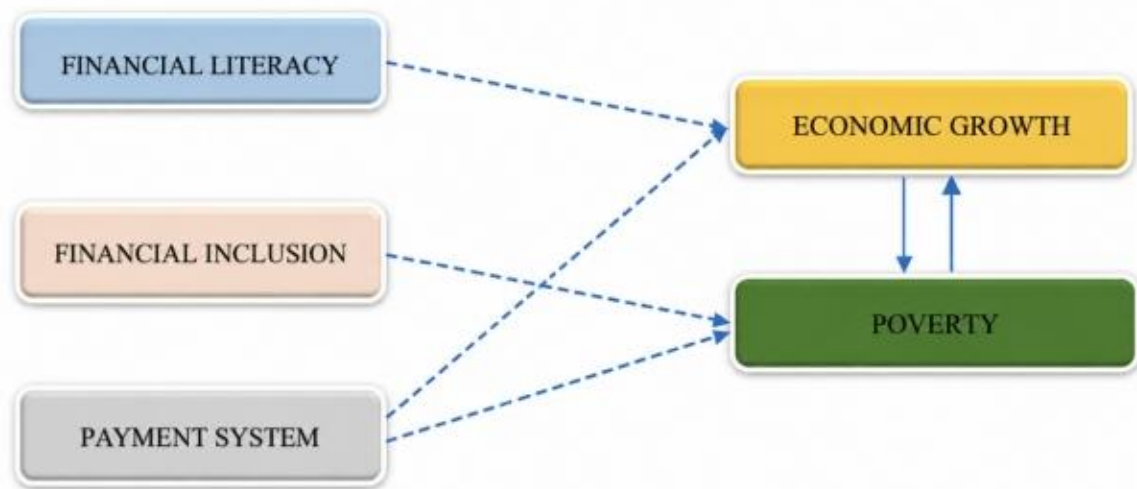


Figure 2. Simultaneous Method Framework for Analysis of Financial Inclusion and Literacy in Reducing Poverty Levels in Indonesia

Source: Author, 2026

Figure 2 shows two structural relationships. The first equation positions economic growth as a function of financial literacy, payment systems, and poverty. The second equation positions poverty as a function of financial inclusion, payment systems, and economic growth. Functionally, these relationships are formulated as follows:

Equation 1 = $PE = (LIT, SP, \text{ and } KEM)$

Equation 2 = $KEM = (INK, SP, \text{ and } PE)$

3.4 Equation Specifications

Simultaneous equation models are estimated using the Two-Stage Least Squares (TSLS) approach. The TSLS method is commonly used to estimate simultaneous equations, especially when the model is over-identified (Widarjono, 2009). According to Gujarati (2012), TSLS is designed for over-identified models, but it can also be used for equations that are exactly identified.

The principle of TSLS is to replace stochastic endogenous variables with linear combinations of predetermined variables in the model. These predetermined variables act as instruments or proxies for the endogenous variables. Based on the established functional relationships, the model is transformed into an econometric equation as follows.

3.5 Economic Growth Equation

$$\text{LOG}(PE) = C(10) + C(11) * \text{LOG}(LIT) + C(12) * \text{LOG}(SP) + C(13) * \text{LOG}(KEM) + \varepsilon^1$$

Information:

SP = Economic growth (%)

LIT = Financial Literacy (%)

SP = Payment system (%)

KEM = Poverty (%)

C = Constant

$\alpha_0 - \alpha_3$ = regression coefficient

= term error

Poverty Equality

$$\text{LOG}(\text{KEM}) = C(20) + C(21) * \text{LOG}(\text{INK}) + C(22) * \text{LOG}(\text{SP}) + C(23) * \text{LOG}(\text{PE}) + \varepsilon^2$$

Information:

KEM = Poverty (%)

INK = Financial Inclusion (%)

SP = Payment system (%)

PE = Economic growth (%)

C = Constant

$\alpha_0 - \alpha_3$ = regression coefficient

ε_2 = term error

The first equation is used to analyze the influence of financial literacy, payment systems, and poverty on economic growth. The second equation is used to analyze the influence of financial inclusion, payment systems, and economic growth on poverty.

3.6 Estimation and Testing Techniques

3.6.1 Identifying Equations

Identification is performed before estimation to determine whether the equation is under-identified, exactly identified, or over-identified. For the 2SLS method to be applied, an equation must satisfy the exactly identified or over-identified condition (Koutsoyiannis, in Rusiadi, 1977).

An equation is said to be identified if it has a unique statistical form and produces unique parameter estimates (Sumodiningrat, in Rusiadi, 2001). Gujarati (1999) explains that identification can be done by including or removing exogenous or endogenous variables from an equation (Sumodiningrat, 2001). The identification conditions are determined using the following criteria:

$K - k < m - 1$ = under identification

$K - k = m - 1$ = exact identification

$K - k > m - 1$ = over identification

Based on the number of variables contained in the system, the identification results of each equation are presented in Table 3.

Table 3. Equation Identification Test

Equality	(Kk)	(m-1)	Comparison	Identification Results
Economic growth	(3-2=1)	(2-1=1)	(1=1)	<i>Exactly identified</i>
Poverty	(3-2=1)	(2-1=1)	(1=1)	<i>Exactly identified</i>

Source: Processed by the author, 2026

Table 3 shows that both equations satisfy the exactly identified condition. Thus, each equation contains sufficient information to produce unique parameter estimates and can be estimated using TSLS.

3.6.2 Two-Stage Least Squares Estimation

Two-Stage Least Squares estimation is performed in two stages. In the first stage, the endogenous variables are regressed against all exogenous or predetermined variables in the

system to obtain predicted values. In the second stage, the predicted values of the endogenous variables are used in the structural equation to obtain consistent coefficients.

In the first equation, economic growth is estimated based on financial literacy, payment systems, and poverty. In the second equation, poverty is estimated based on financial inclusion, payment systems, and economic growth. Data processing and estimation were performed using EViews version 7.1.

3.7 Model Fit Test

Model fit tests are used to assess the ability of an equation to explain the relationship between variables. Tests are conducted using the coefficient of determination, partial tests, and simultaneous tests.

The coefficient of determination (R^2) is used to determine the ability of explanatory variables to explain changes in endogenous variables. An R^2 value closer to one indicates a greater ability of the model to explain changes in the analyzed variables.

The partial t-test is used to determine the significance of the influence of each explanatory variable on the endogenous variable. At a significance level of 5 (%) percent, H_0 is rejected if the probability value is less than 0.05 or the calculated t value is greater than the t table value.

The simultaneous test is used to determine the effect of all explanatory variables simultaneously on the endogenous variable. At a significance level of 5 (%) percent, H_0 is rejected if the probability value is less than 0.05 or the calculated F value $> F_{table}$.

3.8 Residual Diagnostic Test

The residual diagnostic test is adjusted to the tests actually displayed in the research results, namely the multivariate normality test and the residual autocorrelation test.

The normality test is used to determine whether the residuals of a system of equations are normally distributed. The test is conducted using the System Residual Normality Test with the Jarque–Bera statistic and the Cholesky orthogonalization method. The null hypothesis states that the residuals are multivariately normally distributed. The residuals are declared to meet the normality assumption if the Jarque–Bera probability value is greater than 0.05.

The autocorrelation test is used to determine the presence of serial correlation in the residuals of a system of equations. The test is conducted using the System Residual Portmanteau Tests for Autocorrelations. The null hypothesis states that there is no residual autocorrelation up to the tested lag level. The model is declared free of autocorrelation if the QQQ statistic probability or Adjusted Q-Statistic is greater than 0.05.

Result and Discussion

4.1. Variable Development

The development of research variables was analyzed using Indonesian data for the 2015–2025 period. Poverty indicates a community's inability to meet basic food and non-food needs based on the poverty line. The Food Poverty Line refers to consumption needs equivalent to 2,100 kilocalories per capita per day, while the Non-Food Poverty Line covers housing, clothing, education, health, and transportation. Other variables include economic growth, financial inclusion, financial literacy, and payment systems. The development of all these variables is presented briefly in Table 4.

Table 4.Development of Research Variables in Indonesia 2015–2025

Year	Poverty (%)	Economic growth (%)	Financial Inclusion (%)	Financial Literacy (%)	Payment System (Million)
2015	11.22	4.88	36.12	29.66	1.32
2016	10.86	5.03	67.82	38.03	1.48
2017	10.64	5.07	67.82	38.03	1.64
2018	9.82	5.17	76.19	49.68	1.79
2019	9.41	5.02	76.19	49.68	1.87
2020	9.78	-2.07	76.19	49.68	1.18
2021	10.14	3.70	83.60	62.58	1.96
2022	9.54	5.31	83.60	62.58	2.23
2023	9.36	5.05	75.02	65.43	2.47
2024	9.03	5.03	75.02	65.43	2.68
2025	8.47	5.11	80.51	66.46	2.89

Source: BPS and Bank Indonesia data, 2026, processed by the author

Table 4 shows that the poverty rate in Indonesia has generally decreased from 11.22% in 2015 to 8.47% in 2025. The decline continued relatively consistently until 2019, but reversed in 2020–2021 when the COVID-19 pandemic suppressed economic activity, reduced incomes, and increased job losses. During the same period, economic growth contracted by -2.07% in 2020 after previously growing steadily at around 4.88–5.17%. Economic recovery began in 2021 and strengthened to 5.31% in 2022, before stabilizing again at around 5% until 2025. This pattern demonstrates that changes in poverty are related to economic growth, although poverty reduction does not always occur directly and proportionally to increased growth.

The development of the financial sector also showed an upward trend during the study period. Financial inclusion rose from 36.12% in 2015 to 80.51% in 2025, although it declined in 2023–2024 after reaching 83.60% in 2021–2022. This increase indicates broader public access to accounts, savings, financing, insurance, payments, and other formal financial services. The acceleration of financial inclusion during the pandemic is also related to the increased use of digital financial services and the distribution of social assistance through the banking system.

Financial literacy increased from 29.66% in 2015 to 66.46% in 2025. The relatively high increase occurred until 2021, with growth tending to slow towards the end of the period. This indicates progress in people's knowledge and ability to manage their finances, but some groups still face limited access, understanding, and ability to use financial products. Therefore, increasing financial inclusion requires financial education to ensure that available access can be used appropriately and productively.

The payment system also grew from 1.32 million in 2015 to 2.89 million in 2025. The increase was gradual until 2019, then declined to 1.18 million in 2020 due to disruptions to economic activity. After that, the payment system continued to increase consistently from 2021 to 2025. This development reflects the increasingly widespread use of payment instruments to support economic transactions and public access to financial services.

Overall, the data shows that improvements in financial inclusion, financial literacy, and payment systems have occurred simultaneously with economic recovery and poverty reduction. However, this directional development cannot be directly interpreted as a cause-and-effect relationship. Therefore, simultaneous equation analysis was used to examine the influence of financial literacy, financial inclusion, and payment systems. payments to economic growth and poverty, and explain the reciprocal relationship between these two endogenous variables.

4.2. Results of Simultaneous Equation Model Analysis

4.2.1 Residual Diagnostic Test

Residual diagnostic tests are performed before interpreting the results of simultaneous equation model estimation. These tests include residual normality and autocorrelation tests. These tests aim to ensure that the model residuals meet the assumptions required in the estimation process.

4.2.2 Normality Test

The normality test is used to determine whether the residuals in a system of equations are normally distributed. The test is performed using the System Residual Normality Test with the Jarque–Bera statistic and the Cholesky orthogonalization method.

Table 5. Normality Test Results

System Residual Normality Tests				
Orthogonalization: Cholesky (Lutkepohl)				
Null Hypothesis: residuals are multivariate normal				
Date: 06/02/26 Time: 09:52				
Sample: 2015 2025				
Included observations: 7				

Component	Skewness	Chi-sq	df	Prob.
1	0.218477	0.055688	1	0.8134
2	-0.898495	0.941842	1	0.3318
Joint		0.997530	2	0.6073

Component	Kurtosis	Chi-sq	df	Prob.
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1	1.956437	0.317632	1	0.5730
2	3.296437	0.025630	1	0.8728
Joint		0.343262	2	0.8423

Component	Jarque-Bera	df	Prob.
1	0.373320	2	0.8297
2	0.967472	2	0.6165
Joint	1.340792	4	0.8544

Source: EViews 7.1 processing results, 2026

Based on Table 5, the combined Jarque–Bera probability value is 0.8544, which is greater than the 0.05 significance level. Therefore, the null hypothesis that the residuals are normally distributed cannot be rejected. These results indicate that the residuals of the system of equations meet the assumption of multivariate normality.

4.3. Autocorrelation Test

An autocorrelation test is performed to determine the presence or absence of serial correlation in the residuals of a system of equations. The test uses the System Residual Portmanteau Tests for Autocorrelations. The model is declared free of autocorrelation if the probability value of the Q statistic and the Adjusted Q-Statistic are greater than 0.05.

Table 6.Autocorrelation Test

System Residual Portmanteau Tests for
Autocorrelations
Null Hypothesis: no residual autocorrelations up to
lag h
Date: 06/02/26 Time: 09:55
Sample: 2015 2025

Included observations: 7

Lags	Q-Stat	Prob.	Adj Q-Stat	Prob.	df
1	0.072506	0.9994	0.084591	0.9991	4
2	4.402467	0.8191	6.146535	0.6308	8
3	6.003472	0.9159	8.948294	0.7073	12
4	6.439568	0.9826	9.965852	0.8684	16
5	10.78114	0.9517	25.16135	0.1953	20
6	11.06700	0.9885	27.16238	0.2969	24
7	14.43509	0.9838	NA	NA	28
8	14.56470	0.9965	NA	NA	32
9	15.13215	0.9991	NA	NA	36
10	15.20288	0.9999	NA	NA	40
11	15.20288	1,0000	NA	NA	44
12	15.20288	1,0000	NA	NA	48

*The test is valid only for lags larger than the System lag order.
df is degrees of freedom for (approximate) chi-square distribution

Source: EViews 7.1 processing results, 2026

Based on Table 6, the probability values for the Q-statistic at all lag levels displayed are above 0.05. The Adjusted Q-Statistic probability value is also greater than 0.05. Therefore, the null hypothesis stating no residual autocorrelation cannot be rejected. These results indicate that the model residuals do not experience serial correlation.

4.4. Simultaneous Equation Model Estimation Results

The relationship between financial literacy, financial inclusion, payment systems, economic growth, and poverty is estimated using the Two-Stage Least Squares (TSLS) method. The model consists of two structural equations. The first equation places economic growth as an endogenous variable, while the second equation places poverty as an endogenous variable.

Table 7. Simultaneous Equation Model Estimation Results

System: UNTITLED
Estimation Method: Two-Stage Least Squares
Date: 06/02/26 Time: 09:37
Sample: 2015 2025

Included observations: 7
Total system (balanced) observations 14

	Coefficient	Std. Error	t-Statistic	Prob.
C(10)	17.20969	11.87389	1.449373	0.1974
C(11)	-0.062051	0.026505	-2.341114	0.0578
C(12)	0.003474	0.074230	0.046804	0.9642
C(13)	-0.927455	0.952478	-0.973729	0.3678
C(20)	14.71569	1.646261	8.938859	0.0001
C(21)	-0.015234	0.009132	-1.668219	0.1463
C(22)	-0.061428	0.011375	-5.400034	0.0017
C(23)	-0.358970	0.296077	-1.212422	0.2709

Determinants of residual
covariance 0.001081

Equation: $PE = C(10) + C(11) * LIT + C(12) * SP + C(13) * KEM$

Instruments: Lit Ink SP C

Observations: 7

R-squared	0.715836	Mean dependent variable	4.852857
Adjusted R-squared	0.431673	SD dependent var	0.516098
SE of regression	0.389073	Sum squared residual	0.454134
Durbin-Watson stat	1.444681		

Equation: $KEM = C(20) + C(21) * INK + C(22) * SP + C(23) * PE$

Instruments: Lit Ink SP C

Observations: 7

R-squared	0.970114	Mean dependent variable	9.842857
Adjusted R-squared	0.940228	SD dependent var	0.983069

		Sum squared	
SE of regression	0.240344	residual	0.173296
Durbin-Watson			
stat	1.503733		

Source: EViews 7.1 processing results, 2026

Based on Table 7, the estimation results produce two structural equations as follows:

4.5. Test Results Equality1 (Variable Economic growth)

The first equation is the equation used to simultaneously determine economic growth (PE) with the following equation:

$$\text{Log(PE)} = C(10) + C(11)\text{Log(LIT)} + C(12)\text{Log(SP)} + C(13)\text{Log(KEM)} + \varepsilon_1 \quad (4.1)$$

Estimation results:

$$\text{Log(PE)} = 17.20969 - 0.062051\text{Log(LIT)} + 0.003474\text{Log(SP)} - 0.927455\text{Log(KEM)} + \varepsilon_1 \quad (4.2)$$

Equation (4.2) shows that financial literacy and poverty have negative coefficients on economic growth, while the payment system has a positive coefficient. Because the model uses a logarithmic form, each coefficient can be interpreted as an elasticity.

The financial literacy coefficient of -0.062051 indicates that a 1% increase in financial literacy is associated with a 0.062051% decrease in economic growth, assuming other variables remain constant. A probability value of 0.0578 indicates that the effect is insignificant at the 5% level, but marginally significant at the 10% level. A coefficient less than one indicates that the relationship is inelastic.

The payment system coefficient of 0.003474 indicates that a 1% increase in the payment system is associated with a 0.003474% increase in economic growth, assuming other variables remain constant. However, the probability value of 0.9642 indicates that the effect of the payment system on economic growth is not statistically significant. The relationship is also inelastic.

The poverty coefficient of -0.927455 indicates that a 1% increase in poverty is associated with a 0.927455% decrease in economic growth, assuming other variables remain constant. A probability value of 0.3678 indicates that the effect is not significant at the 5% level. The absolute value of the coefficient, which is still less than one, indicates that the relationship between poverty and economic growth is inelastic.

Thus, at the 5% significance level, financial literacy, payment systems, and poverty do not yet show a significant partial effect on economic growth. However, financial literacy does show a marginal level of significance at the 10% level.

Test Results Equality2

The second equation is the equation used to simultaneously determine KEM with the following equation as follows:

$$\text{Log(KEM)} = C(20) + C(21)\text{Log(INK)} + C(22)\text{Log(SP)} + C(23)\text{Log(PE)} + \varepsilon_2 \quad (4.3)$$

Estimation results:

$$\text{Log(KEM)} = 14.71569 - 0.015234\text{Log(INK)} - 0.061428\text{Log(SP)} - 0.358970\text{Log(PE)} + \varepsilon_2 \quad (4.4)$$

Equation (4.4) shows that financial inclusion, payment systems, and economic growth have a negative relationship with poverty. Thus, increases in these three variables tend to be followed by decreases in poverty levels, although the levels of significance vary.

The financial inclusion coefficient of -0.015234 indicates that a 1% increase in financial inclusion is associated with a 0.015234% decrease in poverty, assuming other variables remain constant. A probability value of 0.1463 indicates that the effect of financial inclusion on poverty is insignificant at the 5% level. A coefficient value less than one indicates an inelastic relationship.

The payment system coefficient of -0.061428 indicates that a 1% increase in the payment system is associated with a 0.061428% reduction in poverty, assuming other variables remain constant. A probability value of 0.0017 indicates that the payment system has a negative and significant effect on poverty. This relationship is inelastic because the absolute value of the coefficient is less than one.

The economic growth coefficient of -0.358970 indicates that a 1% increase in economic growth is associated with a 0.358970% decrease in poverty, assuming other variables remain constant. The probability value of 0.2709 indicates that the effect of economic growth on poverty is insignificant at the 5% level. This relationship is also inelastic.

Based on these results, the payment system is the only variable with a significant influence on poverty. Meanwhile, financial inclusion and economic growth have a negative relationship, but have not yet shown a statistically significant effect.

4.6. Partial Significance Test (t-Test)

The t-test is used to determine the partial effect of each independent variable on the endogenous variable in a simultaneous equation model. Decision-making is based on probability values with a significance level of 5%. If the probability value is less than 0.05, the variable is considered to have a significant effect.

In the first equation (economic growth variable), the estimation results show that financial literacy has a probability value of 0.0578, payment systems 0.9642, and poverty 0.3678. Based on these values, all variables do not show a significant influence on economic growth at the 5% significance level. However, financial literacy shows a relationship approaching the 10% significance level.

In the second equation (poverty variable), the estimation results show that financial inclusion has a probability value of 0.1463, the payment system is 0.0017, and economic growth is 0.2709. These results indicate that only the payment system has a significant effect on poverty at the 5% significance level, while financial inclusion and economic growth do not show a significant effect partially.

4.7. Coefficient of Determination(R^2)

The coefficient of determination is used to determine the ability of the explanatory variables to explain changes in endogenous variables in each equation.

In the first equation, the R-squared value of 0.715836 indicates that financial literacy, payment systems, and poverty explain 71.58% of the variation in economic growth. The remaining 28.42% is explained by other variables not included in the model. The adjusted R-squared value of 0.431673 indicates that, after considering the number of variables and observations, the model's explanatory power becomes 43.17%.

In the second equation, the R-squared value of 0.970114 indicates that financial inclusion, payment systems, and economic growth explain 97.01% of the variation in poverty. The remaining 2.99% is explained by variables outside the model. The adjusted R-squared value of 0.940228 indicates that the model retains high explanatory power after adjusting for the number of variables and observations.

Overall, the poverty equation has greater explanatory power than the economic growth equation. However, the magnitude of the coefficient of determination does not directly indicate that all variables have a significant influence. Conclusions must still consider the direction of the coefficient, its probability value, and the model's fit.

4.8. Summary of Test Results

The estimation results show that in the economic growth equation, financial literacy has a negative and marginally significant relationship at the 10% level, while payment systems and poverty have no significant effect. In the poverty equation, payment systems have a negative and significant effect, while financial inclusion and economic growth have a negative but insignificant relationship.

These findings indicate that improvements in payment systems were most strongly associated with poverty reduction during the study period. Meanwhile, increased financial access and economic growth did not directly impact poverty statistically significantly. These

results need to be further discussed by linking them to theoretical foundations and previous research.

4.9. Discussion of Research Findings

Simultaneous analysis is used to explain the relationships between variables in two structural equations. The first equation considers the influence of financial literacy (FIT), payment systems (SP), and poverty (KEM) on economic growth (PE). The second equation considers the influence of financial inclusion (INK), payment systems (SP), and economic growth (PE) on poverty (KEM) in Indonesia.

4.10. Simultaneous Analysis of Financial Literacy (FLP), Payment Systems (SP), and Poverty (KEM) on Economic Growth (PE) in Indonesia

Based on the estimation results, the financial literacy (LIT) variable has a negative relationship and does not significantly influence economic growth (PE) at the 5% significance level. The coefficient of -0.062051 indicates that a 1% increase in financial literacy will be associated with a 0.062051% decrease in economic growth, assuming other variables remain constant. However, the probability value of 0.0578 indicates that financial literacy has an influence approaching the 10% significance level. These results indicate that increasing financial literacy has not directly driven economic growth during the study period.

This research aligns with research (Wibowo S. &, 2021), which explains that financial literacy has a positive and significant impact on regional economic growth. The higher the public's understanding of financial management, access to financial institutions, and investment decision-making, the greater the economic activity, which in turn impacts Gross Domestic Product (GDP).

Based on the estimation results, the payment system (SP) variable has a positive but insignificant relationship with economic growth (PE). The coefficient of 0.003474 indicates that a 1% increase in the payment system only results in a 0.003474% increase in economic growth. The probability value of 0.9642 indicates that this effect is not statistically significant. This indicates that the development of the payment system has not yet fully and directly impacted aggregate economic growth.

This research aligns with research (Pratiwi, 2026), which explains that electronic transactions (part of the payment system) have a positive but insignificant relationship to economic growth. The reason is that usage is still concentrated in large cities and not evenly distributed across regions, so the macro impact is not yet measurably strong.

Furthermore, the poverty variable (KEM) has a negative relationship and does not significantly influence economic growth (PE). A coefficient of -0.927455 indicates that a 1% increase in poverty is associated with a 0.927455% decrease in economic growth. The probability value of 0.3678 indicates that this effect is not statistically significant. This indicates that changes in poverty levels are not yet a direct factor determining changes in economic growth in the research model.

The results of this study align with research by Sari (2026), which explains that poverty has a positive but insignificant coefficient on economic growth. This means that a high number of poor people tends to depress the economy, but the impact is not statistically strong enough due to other balancing factors. Furthermore, research by Firmansyah (2025) explains that poverty has a negative but insignificant effect on economic growth; this is consistent with the positive relationship pattern in regression, as the variables move in opposite directions.

4.11. Simultaneous Analysis of Financial Inclusion (FII), Payment Systems (PPS), and Economic Growth (PE) on Poverty (KEM) in Indonesia

Based on the estimation results, the financial inclusion variable (FINI) has a negative relationship and does not significantly influence the poverty rate (PEM). The coefficient of -0.015234 indicates that a 1% increase in financial inclusion is associated with a 0.015234% decrease in poverty. The probability value of 0.1463 indicates that the effect of financial inclusion is not yet statistically significant. This indicates that increasing access to financial services does not directly reduce poverty unless it is accompanied by the community's ability to utilize these services productively.

This research aligns with research (Wulandari, 2023), which explains that financial inclusion is negatively related to poverty, but the effect is not significant. The reason is that financial access exists, but poor people are unable to utilize it to increase their income and are often burdened by service costs.

The payment system (SP) variable has a negative relationship and a significant effect on the poverty rate (PEM). A coefficient of -0.061428 indicates that a 1% increase in the payment system is associated with a 0.061428 decrease in the poverty rate. A probability value of 0.0017 indicates that the payment system is a variable that significantly influences poverty reduction. This indicates that the development of payment systems, particularly modern and digital payment services, can expand people's access to economic transactions.

This research is in line with research (Putri, 2025), which explains that the wider the use of modern payment systems, the more significant the reduction in poverty rates, especially in rural areas where it was previously difficult to access financial services.

Furthermore, the economic growth (PE) variable has a negative relationship and no significant effect on the poverty rate (KEM). A coefficient of -0.358970 indicates that a 1% increase in economic growth is associated with a 0.358970% reduction in poverty. However, a probability value of 0.2709 indicates that this effect is not statistically significant. This indicates that the economic growth that has occurred is not fully inclusive and has not directly provided equitable benefits to the poor.

The results of this study align with those of Rahayu (2026), which explains that economic growth is negatively related to poverty, but not significantly. This means that the economy is growing, but the benefits are not evenly distributed to the poor; growth is not yet inclusive. Furthermore, research by Wibowo (2025) explains that economic growth has a negative but insignificant coefficient on poverty; other factors such as corruption and human resource quality are more important determinants of poverty reduction.

Conclusion

Based on the results of research on the influence of financial literacy, financial inclusion, payment systems, economic growth, and poverty in Indonesia for the period 2015–2025 using a simultaneous equation model, it can be concluded that the development of the research variables shows different dynamics. The poverty rate generally decreased during the study period, although it increased during the COVID-19 pandemic and experienced a slowdown in the decline towards the end of the period. Economic growth showed a stable pattern before the pandemic, contracted in 2020, and then recovered to around 5%. Meanwhile, financial inclusion, financial literacy, and payment systems experienced increases, indicating increasing public access to financial services.

The first equation estimation results indicate that financial literacy has a negative relationship and does not significantly influence economic growth at the 5% significance level, although it shows a significant trend at the 10% level. Payment systems have a positive relationship but do not significantly influence economic growth. Meanwhile, poverty has a negative relationship but does not significantly influence economic growth. These findings indicate that improvements in financial aspects have not directly had a significant impact on economic growth during the study period.

In the second equation, financial inclusion has a negative but insignificant relationship with poverty. This indicates that increasing access to financial services does not automatically reduce poverty unless it is accompanied by the community's ability to utilize these services productively. Conversely, the payment system has a negative and significant effect on poverty, indicating that the development of the payment system can contribute to increased access to economic transactions and support poverty reduction. Economic growth has a negative but insignificant relationship with poverty, indicating that economic growth has not been fully inclusive in reaching poor communities.

The coefficient of determination indicates that the model has good explanatory power, with the research variables explaining 71.58% of the variation in economic growth and 97.01% of the variation in poverty. Thus, the simultaneous equation model used is able to describe the relationship between financial variables, economic growth, and poverty in Indonesia.

Based on the research findings, the government and financial authorities need to expand the equity of the payment system, particularly in areas with limited access to financial services, as this variable has been shown to influence poverty reduction. Furthermore, increasing financial literacy needs to be directed at underserved groups so that financial management skills can impact productive economic activity.

Financial institutions need to develop products and services that are more accessible, affordable, and tailored to the needs of low-income communities so that financial inclusion not only increases access but also delivers tangible economic benefits. Economic growth policies also need to be directed toward more inclusive development through job creation, increased productivity, and equal economic opportunities.

Further research can consider adding other variables such as human resource quality, income inequality, unemployment rate, or labor productivity as well as extending the observation period so that the relationship between the financial sector, economic growth, and poverty can be analyzed more comprehensively.

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