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Financial Development and Poverty Reduction in Indonesia: An Empirical Investigation

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Article Information Abstract

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Keywords: Financial Development, Poverty Reduction, ARDL-ECM, Indonesia Poverty in Indonesia has decreased but still presents many challenges in achieving significant reduction targets. The main objective of this study is to estimate the effect of financial sector development on poverty in Indonesia. The dependent variable was household final consumption expenditure as a proxy for poverty, while the independent variables were broad money and gross savings. The study used time series data and applied the ARDL-ECM (Autoregressive Distributed Lag–Error Correction Model) method for 1981–2022. The main finding was that broad money did not significantly affect poverty reduction. Gross savings were significant with a negative coefficient; higher savings were associated with higher poverty rates due to decreased consumption. Furthermore, the stability of the research model was tested using normality, serial correlation, heteroscedasticity, cumulative sum (CUSUM), and cumulative sum of squares (CUSUMQ) tests. The financial sector can reduce poverty through efficient financial services for the poor, microeconomic empowerment, and increased financial inclusion. In the future, the government must promote a conducive and competitive financial sector to support poverty alleviation programs.

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INTRODUCTION

Poverty is a complex social condition that is a global issue and is most commonly found in low-income countries (Appiah-Otoo et al., 2022; Ho & Iyke, 2018; Jiang et al., 2020; Khanday et al., 2024; Zameer et al., 2020). Poverty is caused by a lack of disposable income, which can negatively impact the economy, health, social, and education sectors—the economic impact results in low purchasing power. People do not have savings or other investments; thus, economic growth decreases (Khanday et al., 2024). Another impact is that poor people have difficulty accessing quality education and face limited health services (Appiah-Otoo et al., 2022; Ho & Iyke, 2018; Yang & Fu, 2019). Poverty also affects social life, such as high unemployment and crime, disrupting social stability (Appiah-Otoo et al., 2022). According to Khanday et al. (2024), poverty is also a threat to developed countries. Meanwhile, Zahonogo (2017) states that severe poverty levels usually occur in poor countries. Therefore, poverty has become a priority of government policy worldwide to create more decent living conditions for people.

One of the reliable economic policies for poverty alleviation can be carried out through the development of the financial sector (Dewi et al., 2018; Pasuhuk, 2018). The relationship between the development of the financial sector and poverty reduction can be explained through the following transmission mechanism. financial sector contributes to the real sector by production providing factors, increasing employment opportunities, increasing output, increasing national income growth, and reducing poverty levels (Dewi et al., 2018; Khanday et al., 2024; Kheir, 2019). An effective financial system can provide financial services, such as mobilizing savings and better capital allocation for the poor, thereby reducing the gap between the rich and the poor.

Theoretically, the efficiency of the financial sector creates conditions for optimal resource allocation. Financial sector development can be interpreted as increasing the financial market volume (Ho & Iyke, 2018). The

urgency of the financial sector lies in mobilizing public savings, financial intermediation to the real sector, and mobilizing and allocating savings for economic growth (Wardana et al., 2022). Financial sector development includes fund mobilization, trade facilitation, savings collection, liquidity, and risk management (Nuru 2021). Financial Gereziher, development drives economic growth through income distribution. The higher the income in the economy, the smaller the poverty growth (Sumarni, 2019).

As a developing country, Indonesia faces a significant challenge in reducing poverty. BPS-Statistics Indonesia (2024) recorded that the number of poor people in March 2024 was 25.22 million, with an average poverty line per household of IDR 2,786,415.00 per poor household per month. To eradicate poverty, the Indonesian government has implemented various poverty alleviation programs, such as Direct Cash Assistance (BLT), Village Funds, the Family Hope Program (PKH), the Food Assistance Program, the Smart Indonesia Program (PIP), and the Smart Indonesia College Program (PIP-K). In addition, several programs aim to increase community income by empowering Micro, Small, and Medium Enterprises (MSMEs), improving worker competence through training, and expanding access to employment.

Development programs to eradicate poverty will be more effective with the support of financial sector development for resource mobilization (Dewi et al., 2018; Rashid & Intartaglia, 2017). The financial sector's contribution to national economic development is indicated by the ratio of the amount of money in circulation, which continues to grow and is particularly influenced by the development of credit distribution. The proportion of MSME credit to total credit has increased significantly. Credit distribution is also used for working capital and investment. Dewi et al. (2018) emphasize that Indonesia's financial sector has long played an important role in the real sector through capital accumulation and technology transfer. Another contribution is reflected in the

financial sector's performance growth against GDP in Semester 1 of 2023, which stood at 3.68% (BPS, 2024). Increases in the distribution of working capital credit, investment credit, consumer credit, provision/commission income, income from foreign exchange and securities transactions, and transactions by non-bank financial institutions supported this positive performance.

Digital inclusion can expand financial service channels, transcending geographical boundaries. These financial services include savings and investments to strengthen capacity and improve financial management (Liu et al., 2024). In line with this, Tian et al. (2024) noted that it promotes greater participation in development opportunities, equitable income distribution, and poverty reduction.

The financial sector's contribution to poverty reduction through economic development has been an interesting issue among researchers and policymakers. While studies investigating the role of the financial sector in economic growth have been widely conducted, attention to its impact on poverty alleviation remains limited, especially in developing countries (Abdin, 2016). Most studies concluded that financial sector development reduces poverty in various countries (Abdin, 2016; Acheampong et al., 2021; Appiah-Otoo et al., 2022; Bolarinwa et al., 2021; Jiang et al., 2020; Khanday et al., 2024; Majid et al., 2019; Pasuhuk, 2018; Rashid & Intartaglia, 2017; Sehrawat & Giri, 2016a; Wardana et al., 2022; Zulher & Ratnasih, 2021), in contrast to Kaidi et al. (2019). Meanwhile, Alam & Alam (2021) found evidence that the financial sector did not impact poverty reduction.

Specifically, this study addresses the influence of financial sector development on poverty reduction in Indonesia from 1981 to 2022. Financial sector development used broad money and gross saving variables. The poverty rate was used as the variable for total household final expenditure. This study's contribution is to explore further the issues of the financial sector and poverty alleviation comprehensively. Therefore, based on the existing findings, the

relevant authorities can consider formulating policies to ensure a meaningful contribution. The methodological contribution to the literature was using robust estimation methods for time series data to reach conclusions. The structure of this paper is as follows: Section 2 contains data and methodology, Section 3 contains results and indepth discussion, and Section 4 contains conclusions and recommendations.

RESEARCH METHODS

This study analyzed the impact of financial sector development on poverty rates in Indonesia using time series data from 1981 to 2022. Regression estimation used two models to determine the effect of the financial sector on poverty rates. In Model I, the dependent variable was poverty, proxied by households' final consumption expenditure, while the regressors were broad money growth (M2), economic growth (GDP growth), school enrollment, and life expectancy. In Model II, the dependent variable was poverty, proxied by households' final consumption expenditure, while the regressors were gross saving, economic growth (GDP growth), school enrollment, and life expectancy. Data were obtained from the World Bank. All variables were in percentage units, except for the life expectancy variable, which used the years coefficient.

This study examined broad money and gross saving in two distinct models, following Osuma's (2025) study that confirmed economic expansion does not necessarily increase financial inclusion. For instance, inflation exacerbates access to financial services and reduces financial transactions. The uncertainty of prices leads people to manage their finances better by saving or even investing, which, in turn, contributes to greater economic empowerment and reduced poverty levels. Therefore, the proposed model can assess the contributions of broad money and gross saving as essential drivers of poverty alleviation and economic growth.

The regression method used was ARDL-ECM (Autoregressive Distributed Lag-Error Correction Model) to model long-term relationships and short-term dynamics through error correction. The steps in the test included data stationarity tests, selection of lag order criteria, bounds cointegration tests, short-term and long-term analyses, and model stability tests. The advantages of the ARDL-ECM method were its ability to confirm long-term equilibrium among variables and analyze long-term and short-term relationships between various time series variables. The model estimated in this study followed the models of previous studies such as Pasuhuk (2018), Majid et al. (2019), Erlando et al. (2020), and Wardana et al. (2022).

$$pov_{t} = \beta_{0} + \beta_{1}m2_{t} + \beta_{2}growth_{t} + \beta_{3}sch_{t} +$$

$$\beta_{4}life_{t} + \mu_{t} \qquad (1)$$

$$pov_{t} = \beta_{0} + \beta_{1}saving_{t} + \beta_{2}growth_{t} +$$

$$\beta_{3}sch_{t} + \beta_{4}life_{t} + \mu_{t} \qquad (2)$$

The ARDL model was developed by Pesaran et al. (2001). The long-term estimation model in this study is as follows:

The β 1, β 2, β 3, β 4, and β 5 showed the long-term coefficients. If cointegration existed, the next test, namely the error correction model (ECM), could be carried out. Estimation with ECM was carried out based on the following model:

$$\begin{split} \Delta pov_{t} &= \alpha + \sum_{i=1}^{p} \theta_{1i} \Delta pov_{t-1} + \\ & \sum_{j=1}^{q} \varphi_{1j} \Delta m 2_{t-j} + \\ & \sum_{j=1}^{q} \varphi_{2j} \Delta growth_{t-j} + \\ & \sum_{j=1}^{q} \varphi_{3j} \Delta sch_{t-j} + \sum_{j=1}^{q} \varphi_{4j} \Delta life_{t-j} + \\ & {}^{\gamma}ECT_{t-1} + \varepsilon_{t} \qquad (5) \\ \Delta pov_{t} &= \alpha + \sum_{i=1}^{p} \theta_{1i} \Delta pov_{t-1} + \\ & \sum_{j=1}^{q} \varphi_{1j} \Delta saving_{t-j} + \\ & \sum_{j=1}^{q} \varphi_{2j} \Delta growth_{t-j} + \\ & \sum_{j=1}^{q} \varphi_{3j} \Delta sch_{t-j} + \sum_{j=1}^{q} \varphi_{4j} \Delta life_{t-j} + \\ & {}^{\gamma}ECT_{t-1} + \varepsilon_{t} \qquad (6) \end{split}$$

RESULTS AND DISCUSSION

The stationarity condition in time-series variables is essential. A variable is considered stationary if the mean and variance remain constant or fixed at a certain value. Chandio et al. (2019) state that the most important assumption of the ARDL model is the requirement for variables to be stationary at the level or first difference. The F-test becomes invalid if a variable is stationary at the second difference. This study carried out two stationarity tests: the Augmented Dickey-Fuller and Phillips-Perron tests (Table 1). All variables were stationary at the first difference based on the test results. Only a few variables were stationary at the level (see Table 1).

Table 1. Results of Unit Root Tests

		Augmented	Dickey-Full	er	Phillips Perron				
Variables	Level		1st Difference		Level		1st Difference		
v arrables	Intercept	Trend &	Intercept	Trend &	Intercept	Trend &	Intercept	Trend &	
	тистесрі	Intercept	тистесрі	Intercept	тистесрі	Intercept	intercept	Intercept	
POV	-2.423	-3.175	-6.572	-6.489	-2.195	-3.164	-9.761	-9.592	
	(0.141)	(0.103)	(0.000)***	(0.000)***	(0.210)	(0.105)	(0.000)***	(0.000)***	
M2	-4.079	-5.454	-10.550	-10.422	-4.177	-5.445	-16.913	-16.950	
	(0.002)***	(0.003)***	(0.000)***	(0.000)***	(0.002)	(0.000)	(0.000)***	(0.000)**	
SV	-2.457	-3.927	-6.730	-6.600	-2.200	-3.836	-15.957	-15.596	
	(0.133)	(0.019)*	(0.000)***	(0.000)***	(0.209)	(0.024)**	(0.000)***	(0.000)***	
GROW	-5.592	-2.519	-4.814	-4.790	-0.592	-2.096	-4.798	-4.769	
	(0.861)	(0.317)	(0.000)***	(0.002)***	(0.861)	(0.532)	(0.000)***	(0.002)***	

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		Augmented	Dickey-Fuller	r	Phillips Perron			
Variables	Level		1st Difference		Level		1st Difference	
variables	Intercept	Trend & Intercept	Intercept	Trend & Intercept	Intercept	Trend & Intercept	Intercept	Trend & Intercept
SH	0.155	-2.495	-4.688	-4.652	-0.587	-2.971	-4.674	-4.619
LF	(0.966) -2.559	(0.328) -1.001	(0.000)*** -6.334	(0.003)*** -7.190	(0.862) -3.144	(0.152) -0.463	(0.000)*** -6.337	(0.003)*** -7.887
	(0.109)	(0.932)	(0.000)***	(0.000)***	(0.031)	(0.981)	(0.000)***	(0.000)***

Note: () denotes standard error; ***, ***, and * are significant levels of 1%, 5% and 10%, respectively. Source: Data Processed, 2025

After the unit root test was carried out, it was necessary to determine the appropriate lag length. The optimal lag selection in this study used the Akaike Information Criterion (AIC). The chosen lag depended on the extent of cointegration among the variables. Determining

the lag using AIC provided stronger results than the Schwarz Information Criterion (SC) and Hannan-Quinn (HQ). For Model I, the best lag length was 1, while for Model II, the best lag was 2 (see Table 2).

	Table 2. Lag Order Selection Criteria									
	VAR lag order selection criteria									
	Model I									
Lag	LogL	LR	FPE	AIC	SC	HQ				
0	-1293.487	NA	3.30e+23	68.34144	68.55691*	68.41810				
1	-1254.748	65.24538*	1.62e+23*	67.61831*	68.91114	68.07829*				
2	-1236.628	25.74890	2.50e+23	67.98044	70.35063	68.82373				
3	-1216.778	22.98500	3.98e+23	68.25145	71.69900	69.47807				
	VAR lag order selection criteria									
			Model II							
Lag	LogL	LR	FPE	AIC	SC	HQ				
0	-1197.735	NA	2.13e+21	63.30186	63.51733*	63.37852*				
1	-1172.757	42.06940	2.17e+21	63.30298	64.59581	63.76296				
2	-1144.786	39.74764*	1.99e+21*	63.14663*	65.51682	63.98993				
3	-1129.343	17.88170	4.00e+21	63.64962	67.09717	64.87623				

Source: Data Processed, 2025

The next stage could be determined by cointegration with the Bound Test. If the F-value was higher than I(1), people rejected the null hypothesis and concluded that the long-term relationship and cointegration existed. Findings with Bound Testing indicated a tendency for these variables to move jointly in the long-term

or long-term movement (Table 3). Model I had an F-value of 7.287, greater than I0 and I1. Model I1 also had an F-value greater than I0 and I1 at p-values of 1% and 5%. Thus, it can be stated that the variables in the study had a longterm relationship.

Table 3. ARDL Bound Test

Model I	Test Statistic	Value	k	Critical Value Bounds	I0 Bound	I1 Bound
	F-statistic	7.287	4	Significance		
				10%	2.2	3.09
				5%	2.56	3.49
				2.5%	2.88	3.87
				1%	3.29	4.37

Model II						
	F-statistic	5.805	4	Significance		
				10%	2.2	3.09
				5%	2.56	3.49
				2.5%	2.88	3.87
				1%	3.29	4.37

Source: Data Processed, 2025

Table 4. Estimated Long-term Coefficient Using the ARDL Model

Dependent Variable: Poverty	Model I	Model II
M2	-0.215 (0.831)	-
SV	-	-2.292 (0.028)
GROWTH	-3.521 (0.001)	-4.360 (0.000)
SCH	-1.398 (0.171)	-3.493 (0.001)
LIFE	2.314 (0.027)	3.023 (0.005)
С	1.642 (0.109)	4.766 (0.000)
Optimal lag structure	ARDL(1, 1, 0, 1, 0)	ARDL(1, 0, 2, 0, 1)
Normality Test	$0.250 (\rho\text{-value} = 0.882)$	$1.174 (\rho\text{-value} = 0.555)$
Serial correlation LM	1.290 (ρ -value = 0.256)	$0.415 (\rho\text{-value} = 0.812)$
Heteroscedasticity	15.480 (ρ -value = 0.030)	$6.217 (\rho\text{-value} = 0.622)$

Note: () denotes standard error; ***, **, and * are significant levels of 1%, 5% and 10%, respectively.

Source: Data Processed, 2025

Table 4 presents the results of the longterm estimation. The estimation results of Model I showed that broad money was not significant in reducing poverty in Indonesia. This finding aligns with Sehrawat & Giri (2016), who also found that the role of broad money was insignificant in reducing poverty in South Asian countries. The effectiveness of financial development can vary across countries, depending on the maturity and inclusiveness of their financial sectors. If financial development does not contribute to poverty reduction, it may be because the benefits are primarily enjoyed by wealthier segments of society, making it ineffective for poverty alleviation. The government's role in maintaining price stability in Indonesia is crucial to preserving people's purchasing power.

The findings of this study are also supported by previous research, although with varying results. Some studies have shown a negative relationship between financial development and poverty (Alam & Alam, 2021), while others have found a significant impact of financial development on poverty reduction (Rashid & Intartaglia, 2017; Wardana et al., 2022). Several studies have also confirmed a long-term relationship between development and poverty (Abosedra et al., 2016;

Dewi et al., 2018; Majid et al., 2019; Uddin et al., 2014). Generally, broad money contributes to direct poverty reduction and economic growth (Abdin, 2016; Kousar et al., 2019). Furthermore, Zahonogo (2017) emphasized that financial development is inseparable from poverty alleviation programs. Therefore, appropriate policy reforms are needed, particularly those that promote trade openness, effective governance, and improved ease of doing business for people experiencing poverty.

The estimation results of Model I showed that economic growth was significant with a negative coefficient, indicating that higher GDP was associated with lower public consumption. This outcome suggests that increased economic growth may not translate into widespread consumption gains, possibly due to unequal distribution of income and the concentration of development benefits among the wealthy. These findings are consistent with Alam & Alam (2021) and Appiah-Otoo et al. (2022), who found that economic growth did not significantly reduce poverty. However, they contrast with Dhrifi (2015), who reported a positive and significant relationship between per capita growth and household per capita consumption expenditure.

Furthermore, Model I revealed that education was statistically insignificant in

influencing poverty. This finding diverges from Pasuhuk (2018), who demonstrated a significant relationship between education and poverty reduction. Ideally, improved education levels should help break the cycle of poverty, as higher education increases individuals' opportunities for better employment and improved living standards. Although educational programs in Indonesia have continued to improve, challenges remain. These include gaps in access, quality, and the community's competitiveness in securing employment or starting businesses.

Additionally, the Model I results indicated that life expectancy was significant with a positive coefficient, suggesting that longer life expectancy is associated with increased consumption and reduced poverty. This finding aligns with Pasuhuk (2018), who found that life expectancy contributes to poverty reduction. Life expectancy reflects a country's socio-economic conditions, and healthy human capital is a critical production factor for enhancing economic performance and alleviating poverty.

Meanwhile, the estimation results of Model II showed that gross saving was significant with a negative coefficient, implying that higher levels of savings were associated with reduced consumption and increased poverty. This finding supports Pasuhuk (2018), who observed a positive and statistically significant relationship between saving and poverty. The rationale is that increased savings can reduce public expenditure, exacerbating poverty. However, this result contrasts with Sehrawat & Giri (2016a), who argued that financial development could reduce poverty by lowering transaction costs and enabling people experiencing poverty to accumulate savings. Moreover, financial development can assist the poor in utilizing their savings or accessing credit establish small businesses, generate employment, boost income, and ultimately reduce poverty (Appiah-Otoo et al., 2022; Zhang & Ben Naceur, 2019).

The results of the Model II estimation emphasized that economic growth was significant with a negative coefficient. This indicated that higher economic growth was associated with lower household consumption. This finding can be justified by Todaro & Smith (2012), who argued that higher income levels, accompanied by a fixed income distribution, could lead to increased poverty. In such cases, the worsening of income distribution tends to intensify poverty, particularly in developing countries. According to Aginta et al. (2018), Indonesia's financial market has continued to grow alongside economic growth. However, it is still considered reasonable to observe increased inequality in income distribution during the early stages of financial development.

Previous studies also supported the significant role of economic growth in influencing poverty, such as Acheampong et al. (2021), Appiah-Otoo et al. (2022), Rashid & Intartaglia (2017), and Sehrawat & Giri (2016), who found that economic growth negatively affected poverty. Bolarinwa et al. (2021) reported a negative impact of economic growth on poverty. Similarly, Alam & Alam (2021) found that while economic growth failed to reduce poverty in the long term, it had short-term success. Economic growth and poverty are interrelated in a two-way causal relationship (Kheir, 2019).

Savings contribute to increased poverty due to an unsustainable business environment, lack of supporting facilities, and poor institutional governance. Other personal factors, as indicated by Tian et al. (2024), include individual inability to improve the economic situation and lack of financial literacy, resulting in non-optimal resource allocation. Liu et al. (2024) also explained that varied family sensitivity is due to small incomes, leading to lower savings rates and financial vulnerability.

In addition, the results of the Model II estimation indicated that education was significant to poverty with a negative coefficient. The higher the education level, the lower the household consumption. This finding was contrary to that of Bolarinwa et al. (2021), where education was proven to help reduce poverty. Education allows people to acquire skills that change their poor economic status. Kheir (2019) states that one of the requirements for economic

growth is adequate education to produce ideal human capital. Likewise, an undeveloped financial sector can cause obstacles to the education system. In line with this, Singh & Huang (2015) also argue that if the financial market operates efficiently, funds for education will be more easily accessible to people experiencing poverty. The results of the Model II

estimation showed that life expectancy had a significant positive effect on poverty. It meant that the longer the population lives, the more consumption or a decrease in poverty occurs. For the robust test, both Model I and II passed the normality test, serial correlation, and heteroscedasticity.

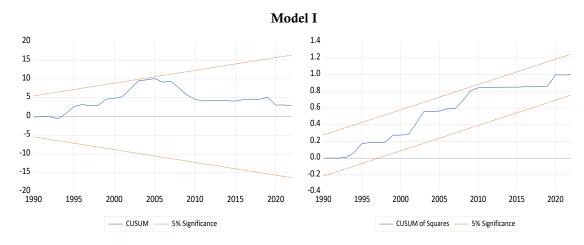
Table 5. Estimated Short-term Coefficient Using ARDL-ECM Model

Variable	Coefficient	Std. Error	t-Statistic	ρ-value				
Model I, Dependent Variable: Poverty								
D(GROWTH)	-1.150	1.580	-7.249	0.000				
D(M2)	-0.134	0.028	-4.757	0.000				
CointEq(-1)*	-0.749	0.105	-7.095	0.000				
Adj. R-squared		0.619						
	Model II, Dep	endent Variable: Po	overty					
D(LIFE)	0.233	0.148	1.570	0.126				
D(LIFE(-1))	-0.454	0.151	-2.995	0.005				
D(SV)	-0.814	0.024	-32.720	0.000				
CointEq(-1)*	-0.387	0.060	-6.359	0.000				
Adj. R-squared		0.9	772					

Note: () denotes standard error; ***, **, and * are significant levels of 1%, 5% and 10%, respectively. Source: Data Processed, 2025

Table 5 shows the results of the Error Correction model test to determine changes in the independent variable on the dependent variable in the short term. The estimation results emphasized that the ECT coefficient value in Model I and Model II was significant and had a negative sign. The ECM estimation results above showed that in the short- and long-term, the variables used in this study had a significant effect on poverty. The Adj. R-squared values of model

I and model II were 0.61 and 0.97, respectively, indicating that the independent variables included in the models were quite good. The Cusum and QusumQ tests were used to test the stability of the model, which tested the parameter firmness. From the graph, the significant value at the 5% level with the blue line did not cross the red line, so the estimated ARDL model was stable.



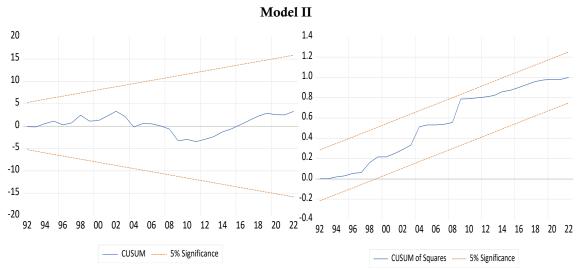


Figure 1 Stability Test under CUSUM and CUSUMSQ

Source: Secondary data processed

CONCLUSION

Both theory and evidence showed that financial development could indirectly affect poverty. Financial sector development could reduce poverty through economic growth. Financial sector development could reduce poverty by increasing poor people's access to financial services and reducing income inequality through economic growth. Based on these conditions, this study's objective was to estimate whether the development of the financial sector affected poverty reduction in Indonesia. In this study, the financial development variables used were broad money and savings. The main findings proved that broad money did not significantly reduce poverty in Indonesia. Saving was proven to be significant, with a negative coefficient sign, which meant that an increase in savings caused an increase in poverty because of a reduction in household expenditure.

Due to this urgency, the following policy recommendations were needed. (a) As a regulator and supervisor, the government was required to prepare policies and reform the financial system to reduce poverty and income inequality. (b) The provision of facilities with efficient financial sector governance and institutions. (c) Inclusive financial development is needed to serve the working-age poor, especially in rural areas. (d) Intervention in

facilitating financial institutions to serve people experiencing poverty with easy administration and adequate infrastructure.

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