

Financial Inclusion as a Silver Bullet in Poverty Reduction: A Longitudinal Data Case Study

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ABSTRACT

Poverty reduction remains a critical challenge in developing economies, including Indonesia, despite robust economic growth and financial sector expansion. This study investigates the impact of financial inclusion, financial literacy, and socio-economic characteristics on household poverty. Utilizing longitudinal data from the fifth wave of the Indonesia Family Life Survey, the analysis focuses on a sample of 2,222 households. Poverty is operationalized through the Multidimensional Poverty Index (MPI), encompassing health, education, and living standards, while financial inclusion is measured via a financial deprivation index across four dimensions: transactions, savings, credit, and insurance. Using logistic regression to account for the non-linearity of binary outcomes, the results indicate that both financial inclusion and financial literacy significantly reduce the probability of household poverty. These findings suggest that access to and understanding of formal financial services are vital for enhancing economic resilience. Furthermore, education and age are negatively associated with poverty, underscoring the role of human capital. Conversely, larger household sizes and rural residency increase poverty risk, highlighting structural vulnerabilities and spatial inequalities. While industrial participation mitigates poverty, agricultural dependence and limited market access remain significant constraints. These results emphasize the need for integrated policies that strengthen financial inclusion, promote literacy, and improve rural infrastructure to foster sustainable poverty reduction in Indonesia.

ARTICLE INFO

Article history:

Received: October 10th, 2025

Revised: December 19th, 2025

Accepted: December 30th, 2025

Published: January 8th, 2026

Keywords:

Financial inclusion;
Multidimensional poverty
index; Financial literacy; IFLS;
Logistic regression

JEL classification:

G10
G50
I32
O15

Citation:

Hanapia, A. Y., Jumri, Surgawati, I., Yuliani, N. M., Adam, A. M., & Mukti, M. (2025). Financial Inclusion as a Silver Bullet in Poverty Reduction: A Longitudinal Data Case Study. *Jurnal Ekonomi Pembangunan*, 23(2), 31-44. DOI: 10.29259/jep.v23i2.23472

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1. INTRODUCTION

Financial inclusion contributes positively to household livelihoods, supports household investment, develops family businesses, and strengthens household financial fundamentals (Bruhn & Love, 2014; Burgess et al., 2005; Churchill & Marisetty, 2020; Du et al., 2023; Dupas & Robinson, 2013; and Gupta & Sedai, 2023). Recent scholarship increasingly identifies financial inclusion as a transformative mechanism for achieving macroeconomic stability, sustainable growth, and poverty alleviation across both developed and developing economies. By enhancing the accessibility, availability, and utilization of regulated financial services, financial inclusion serves as a catalyst for broader social integration. Specifically, it targets marginalized demographics, including rural residents, women, and low-income households who derive substantial utility from foundational services such as savings, credit, payment systems, and insurance (Duvendack & Mader, 2019; Nandru et al., 2021; Panda et al., 2023; and World Bank, 2013). In many developing nations, inadequate income levels and systemic market discrimination leave millions excluded from the formal financial system (Vishnoi et al., 2022), resulting in the erosion of potential savings, investment capital, and wealth accumulation. Financial inclusion serves to bridge this gap, providing households and enterprises with the necessary resources for consumption smoothing and productive investment, thereby stimulating overall economic activity (Omar & Inaba, 2020).

Despite positive global progress in poverty reduction and prosperity over the past few decades, a large proportion of the population, particularly in Asia, continues to struggle to meet minimum living standards (Peng et al., 2023; and Zmuda et al., 2022). While the Asian region possesses a robust history of poverty alleviation, the regional poverty rate remains significant, with 7.3% of the population living below the international poverty line (Islam et al., 2023; and Kizi, 2025). Indonesia, though officially classified as an upper-middle-income country, continues to face persistent poverty challenges (World Bank, 2016). World Bank data reveals that while Indonesia's poverty rate declined from 24% in 1999 to approximately 11.3% by 2014, the pace of this reduction has since decelerated, leaving a large portion of the population vulnerable to economic shocks (World Bank, 2014). This systemic vulnerability is underscored by more recent assessments; when measured against upper-middle-income poverty lines, over half of the population (60.3%) is classified as either poor or economically vulnerable (World Bank, 2025). Furthermore, Suryahadi & Izzati (2018) argue that Indonesian economic growth has become increasingly less pro-poor in recent years. Consequently, as absolute poverty levels have declined, further alleviation has become more complex, requiring more targeted and nuanced interventions.

Consequently, financial inclusion has emerged as a cornerstone of the global reform agenda, garnering significant academic and policy attention for its potential to dismantle the "vicious cycle" of poverty. In Indonesia, the promotion of financial inclusion is particularly critical given the persistence of household vulnerability despite sustained macroeconomic growth and declining income-based poverty. Empirical evidence from developing economies suggests that households remain economically fragile and highly susceptible to idiosyncratic shocks, such as health crises or income volatility, when access to formal financial services is constrained (Omar & Inaba, 2020; and Saha & Qin, 2023). In the Indonesian context, the prevalence of informal employment and small-holder agriculture limits access to formal credit, savings, and insurance, thereby undermining the capacity of households to smooth consumption and mitigate risks (Erlando et al., 2020; Nyarko et al., 2023; Adam et al., 2025). Recent scholarship further demonstrates that financial inclusion enhances not only monetary income but also non-monetary welfare dimensions, including educational attainment, health security, and overall living standards (Koomson et al., 2023; and Tao et al., 2023). Such structural dynamics position financial inclusion as a vital mechanism for addressing multidimensional poverty. Recognizing this, the Indonesian government has implemented various institutional frameworks, most notably the National Strategy for Financial Inclusion (*Strategi Nasional Keuangan Inklusif* or SNKI) launched in 2016. While these initiatives have successfully increased the national financial inclusion index (Dewan Nasional Keuangan Inklusif, 2023), significant systemic disparities persist across geographic regions and socioeconomic strata.

Indonesia's financial inclusion landscape is characterized by a paradox of rapid digital expansion alongside persistent rural–urban disparities and a significant unbanked population. Over the past decade, the proliferation of digital financial services, including mobile banking, e-wallets, and agent-based banking, has markedly improved access to basic transactions, primarily within urban centers (Demirguc-Kunt et al., 2018; Du et al., 2023). Conversely, households in rural and agricultural regions continue to face restricted access due to deficient digital infrastructure and low levels of financial literacy (Erlando et al., 2020; Hanandita & Tampubolon, 2016). World Bank data underscores this exclusion, noting that during the mid-2010s, a substantial proportion of Indonesian adults remained unbanked, with the highest concentration among low-income, rural, and informally employed cohorts (Demirguc-Kunt et al., 2018). Collectively, these patterns suggest that broadening financial inclusion, particularly through inclusive digital finance, is essential for mitigating spatial inequalities and enhancing household resilience.

Financial inclusion influences multidimensional poverty through several distinct mechanisms that bolster a household's capacity for risk management and long-term welfare maintenance. Access to formal financial instruments, such as savings, credit, digital payments, and insurance, allows households to effectively navigate income volatility, health-related expenditures, and employment shocks, thereby reducing deprivations in health and living standards (Omar & Inaba, 2020; and Saha & Qin, 2023). Furthermore, streamlined access to credit and payment systems facilitates small-scale investment and asset accumulation, which are vital for the economic security of informally employed households

(Nyarko et al., 2023). Recent empirical scholarship highlights that digital financial services further reduce transaction costs and improve access to markets and social transfer systems, particularly for marginalized groups, yielding positive externalities for education and health outcomes (Koomson et al., 2023). These mechanisms suggest that financial inclusion serves as a critical intervention for poverty reduction, addressing not only income levels but also the non-monetary dimensions of deprivation captured by the Multidimensional Poverty Index (Liu et al., 2025).

Despite the growing discourse on financial inclusion, a paucity of empirical impact analysis remains due to data constraints (Saha & Qin, 2023), highlighting the urgent need for more granular data on the utilization of financial services among impoverished communities. Existing scholarship indicates that the efficacy of financial inclusion is context-dependent; while it significantly contributes to poverty reduction in developing nations, its impact in developed economies is often negligible (Omar & Inaba, 2020; and Saha & Qin, 2023). Beyond its role as a dynamic instrument for sustainable and equitable growth, financial inclusion is widely theorized to dismantle poverty traps (Demirguc-Kunt et al., 2018; Omar & Inaba, 2020). While many developing countries have seen their financial inclusion indices rise to moderate or high levels, driven by factors such as technological infrastructure, income growth, and robust legal frameworks (Nyarko et al., 2023), Empirical results regarding its impact on poverty remain heterogeneous. While several studies affirm that financial inclusion exerts a significant positive influence on poverty reduction across various indicators (Dogan et al., 2022; and Kelikume, 2021; Lal, 2018). Other studies using household survey data also show that poverty can decrease due to increased financial inclusion (Dogan et al., 2022; Polloni-Silva et al., 2021; and Wang & He, 2020), the literature is far from unanimous. Some scholars argue that financial inclusion may stimulate macroeconomic expansion without necessarily translating into poverty alleviation (Churchill & Marisetty, 2020). Notably, research in Indonesia has occasionally revealed a negative relationship between financial inclusion and poverty reduction (Erlando et al., 2020). Meanwhile, findings from India suggest that financial inclusion may have no discernible effect on poverty levels at all (Neaime & Gaysset, 2018).

These conflicting findings underscore critical gaps in the current literature. Most existing studies rely on unidimensional, income-based poverty measures, which fail to capture how financial inclusion influences the non-monetary dimensions of deprivation. Furthermore, there is a lack of research integrating financial inclusion with multidimensional poverty frameworks using longitudinal microdata. This study addresses these gaps by examining the relationship between financial inclusion and multidimensional poverty in Indonesia. Utilizing longitudinal data to capture socio-economic dynamics, we assess the varying levels of financial inclusion between poor and non-poor households. Ultimately, this research provides new perspectives for policymakers to foster inclusive growth. The remainder of this article is structured as follows: the methodology section outlines the data sources and variable operationalization; the results and discussion section presents the empirical findings; and the conclusion synthesizes the research relevance, policy implications, and study limitations.

2. RESEARCH METHODS

2.1. Data

This study utilizes longitudinal data from the Indonesia Family Life Survey (IFLS), a high-fidelity dataset designed for multi-level analysis at the individual, household, and community levels. The IFLS provides a comprehensive representation of approximately 83% of the Indonesian population, covering diverse demographic and socio-economic characteristics. Data collection has occurred periodically every five to seven years since 1993 (IFLS-1), with the most recent full wave conducted in 2014 (IFLS-5). We specifically employ IFLS-5 data because its granular nature facilitates the multidimensional measurement of poverty. While the full IFLS-5 wave encompasses 16,204 households and 50,148 individuals, this study applies specific filtering criteria to focus on household-level characteristics while incorporating individual and community-level variables to refine the poverty metrics. This dual approach balances the individual perspective, which often examines personal decision-making (Calnitsky, 2018), with the community perspective, which accounts for the structural and civic factors that influence family welfare (Myers, 2016). Following data cleaning and the exclusion of incomplete observations, the final analytic sample consists of 2,222 households.

Table 1. Dimensions and Indicators of the Multidimensional Poverty Index (MPI)

Dimension	Indicator	Poverty threshold "An individual is deprived if..."	Weight
Health	• Nutrition	There are household members with poor nutrition (malnutrition).	1/6
	• Child mortality	There is any child under the age of 18 who passed away prior to the survey.	1/6
Education	• Years of schooling	There are household members who did not complete primary school.	1/6
	• School attendance	There are household members aged 7-15 who do not attend school.	1/6
Standard of living	• Cooking fuel	Households still use traditional cooking fuels (kerosene, firewood and charcoal).	1/18
	• Sanitation	Households do not have adequate sanitation.	1/18
	• Access to drinking water	Households do not have access to adequate drinking water (mineral water).	1/18
	• Electricity	Household does not use electricity.	1/18
	• Housing condition	Households own houses with inadequate floors, walls and roofs made of natural or rudimentary materials.	1/18
	• Assets	Households do not own assets such as vehicles (car, motorcycle, bicycle) and household equipment (TV, tape, radio, refrigerator, sewing machine, washing machine, computer, VCD, cell phone, etc.).	1/18

Source: Alkire et al. (2011), Najitma et al. (2020), modified

In the Indonesian context, traditional proxies such as income or expenditure per capita often fail to capture the nuances of socioeconomic, demographic, and geographic disparities (Fauzi et al., 2022). To address this, we adopt the Multidimensional Poverty Index (MPI) framework proposed by Alkire et al. (2017). This framework assesses deprivation across three core dimensions: health, education, and living standards. As shown in Table 1, each of the three dimensions is assigned an equal weight of 1/3. Within each dimension, individual indicators are weighted equally to ensure a balanced aggregation. The selection of indicators is informed by established empirical literature on Indonesian poverty dynamics (Alkire et al., 2017; Fauzi et al., 2022; Hanandita & Tampubolon, 2016; and Najitama et al., 2020). In accordance with the Alkire-Foster methodology, a household is classified as multidimensionally poor if its cumulative deprivation score exceeds the threshold of 1/3 ($k \geq 0.333$).

Following the framework established by Zhang & Posso (2019), financial inclusion in this study is operationalized inversely through the concept of financial deprivation. This deprivation index is constructed from four dimensions: transactions, savings, credit, and insurance. Each dimension is assigned an equal weight of 25% (1/4), culminating in a composite score ranging from 0 to 100%. Due to the specific data structure of the IFLS, the "savings account" variable originally used by Zhang & Posso (2019) is adapted into a transactions dimension. This dimension distinguishes between households utilizing formal financial institutions and those relying on informal mechanisms. The remaining dimensions are defined as follows in Table 2.

Table 2. Dimensions and Indicators of the financial inclusion

Dimension	Indicator	Financial inclusion threshold "An individual is deprived if..."	Weight
Transaction	• Formal vs Informal financial institution	If the household does not conduct borrowing transactions at formal financial institutions	1/4
Saving	• Saving/deposit/stock	If the household has no savings/deposits/stock	1/4
Credit	• Loan	If the household does not have a loan	1/4
Insurance	• Private health insurance	If the household does not have private health insurance	1/4

Source: Zhang & Posso (2019)

The savings dimension of deprivation is identified if a household lacks formal deposits, stocks, or other regulated savings instruments. Meanwhile, the credit dimension reflects the absence of access to formal loans or credit facilities. The insurance dimension represents the use of assessing the lack of financial products utilized for mitigating idiosyncratic economic shocks. A deprivation threshold of 50% is applied; households with an aggregate score of $\geq 50\%$ are classified as financially deprived. This classification signifies a critical lack of access to formal financial products and services, reflecting the structural barriers to financial integration.

2.2. Model Specification

This study uses a limited dependent variable (LDV) to analyze the relationship between financial inclusion and poverty. To address potential violations of the normality and homoscedasticity assumptions and to ensure that the conditional probability meets the criteria of $0 \leq E(MPI = 1 | x) \leq 1$, this study employs a logistic regression model to examine the determinants of poverty. The model is particularly suitable for binary outcome variables, allowing for the estimation of the likelihood that a household being poor condition given a set of explanatory factors. The results are presented as odds ratios (ORs) with corresponding 95% confidence intervals. The logistic regression model is specified as follows:

$$\log \left(\frac{P(MPI = 1)}{1 - P(MPI = 1)} \right) = \beta_0 + \beta_1 Finclusion_i + \beta_2 Fliteracy_i + \sum_{j=1}^n \gamma_j X_i + \sum_{j=1}^n \delta_j Y_i \epsilon_i \quad (1)$$

The primary dependent variable in this study is household multidimensional poverty, a binary indicator identifying households deprived across the dimensions of health, education, and living standards. The comprehensive summary of the operational definitions for all variables is presented in Table 3.

Table 3. Description of Variables

Variables	Description	Value
MPI	Each indicator has a weight of 1/3 (0.333). If the MPI Score value is less than 0.333 then it is said to be poor, if the MPI Score is more than 0.333 then it is said to be poor.	1 = Poor (MPI score > 0.333); and 0 = Otherwise (MPI score < 0.333)
Financial characteristics		
<i>Financial inclusion</i>	Financial inclusion as measured by deprivation on transaction, savings, credit, and insurance indicators.	1 = deprived financial inclusion; and 0 = well-off financial inclusion
<i>Financial literacy</i>	Financial literacy is measured by how well household members know about financial products such as loan.	1: know about loans 0: otherwise
Socio-economic characteristics		
<i>Education</i>	Years of schooling completed by household members	Years
<i>Marital status</i>	Marital status of household members	1 = marriage; and 0 = otherwise
<i>Age</i>	Age of household members	Years
<i>Household size</i>	number of members in the household	People
<i>Dependency ratio</i>	a ratio that explains the burden borne by productive age and non-productive age	Ratio
Community characteristics		
<i>Industry</i>	Presence of the industrial sector in the area where households live as the main business field	1 = Industry; and 0 = otherwise
<i>Agriculture</i>	Presence of the agricultural sector in the area where households live as the main business field	1 = agricultural; and 0 = otherwise
<i>Market access</i>	Describes the road conditions in the area where the household lives	1 = paved road; and 0 = otherwise
<i>Region</i>	describes where the household lives in urban or rural areas	1 = urban; and 0 = rural

The core explanatory variables are financial inclusion and financial literacy, which capture distinct yet highly interrelated dimensions of household engagement with the formal financial system. While financial inclusion denotes the availability and actual utilization of formal services such as savings, credit, payment instruments, and insurance, financial literacy represents the cognitive ability to evaluate financial products and make informed utility-maximizing decisions. These two components are treated as complementary mechanisms: access to financial services may not yield welfare improvements if households lack the requisite skills for their appropriate use. Conversely, financial literacy possesses limited practical utility in the absence of accessible and affordable financial institutions. Thus, inclusion expands the opportunity set, while literacy optimizes the effective and productive application of those options.

To isolate the impact of financial variables, we control for a range of socio-economic and community-level factors: X_i denotes a vector of household socio-economic characteristics, including the education level of the household head, marital status, age, number of household members, and dependency ratio; Y_i denotes a vector of community characteristics, namely the presence of an industrial sector, an agricultural sector, market access, and the area where the household lives. These covariates are essential for controlling for the structural vulnerabilities and environmental contexts that influence household poverty trajectories.

3. RESULTS AND DISCUSSION

3.1. Results

The final analytic sample comprises 2,222 households, of which 732 are classified as multidimensionally poor and 1,490 as non-poor. Table 4 provides the summary statistics for the primary variables, disaggregated by poverty status. Several significant disparities emerge between the two cohorts, particularly regarding financial inclusion, financial literacy, educational attainment, and structural economic participation. The proportion of households suffering from financial deprivation is markedly lower among the non-poor (49.12%) compared to the poor (67.21%). This substantial prevalence of financial exclusion among poor households suggests that poverty functions not only as a socio-economic outcome but also as a structural constraint that impedes engagement with the formal financial system (Beck et al., 2007). The disparity in financial literacy is equally pronounced: 82.10% of poor households demonstrate financial literacy awareness, compared to 90.34% among their non-poor counterparts. This gap underscores the critical role of financial capability as a mediating factor between income levels and financial integration, echoing the findings by Xu & Zia (2012); and Grohmann et al. (2018). Enhanced financial literacy facilitates the efficient utilization of financial products, enabling households to manage risks more effectively, optimize savings, and engage in productive investment, thereby mitigating long-term vulnerability to poverty.

Human capital disparities present a stark contrast between the two cohorts. Among poor households, the majority attained only an elementary education (58.85%), whereas higher educational attainment is overwhelmingly concentrated among the non-poor, with 78.27% completing high school and over 83% holding bachelor's degrees. This educational divide strongly supports human capital theory (Becker, 1975), which posits that advanced education enhances productivity and earning potential, thereby serving as a robust buffer against poverty. Notably, the presence of doctoral degree holders exclusively within the non-poor group further underscores the longitudinal correlation between high-level expertise and economic security. Household composition also reflects significant socioeconomic divergence. Poor households maintain larger average sizes (4.35 ± 1.44) compared to non-poor households (4.10 ± 1.18). Given that the dependency ratios are nearly identical across both groups (0.42 vs. 0.41), the higher poverty risk in larger households may be attributed to diminished per capita resources and the lack of economies of scale in consumption.

Regarding economic participation, both groups exhibit a significant orientation toward agriculture, though the intensity differs. Approximately 89.62% of poor households identify agriculture as their primary economic activity, compared to 80.74% of non-poor households. In contrast, industrial employment, a sector typically associated with higher wage stability, is more prevalent among the non-poor (73.83%) than the poor (63.11%).

Table 4. Result of Summary Statistic

Variables	Poor households		Non-poor households	
	n = 732 ^{a)}	%	n = 1,490 ^{a)}	%
Deprived financial inclusion	492	67.21	732	49.12
Aware about financial literacy	601	82.10	1,346	90.34
Education				
Not in school	22	66.67	11	33.33
Elementary school	296	58.85	207	41.15
Intermediate school	177	37.82	291	62.18
High school	181	21.73	652	78.27
Diploma	11	10.68	92	89.01
Bachelor	44	16.99	215	83.01
Master	1	4.76	20	95.25
Doctoral	0	0.00	2	100.00
Industry as the main sector	462	63.11	1,100	73.83
Agriculture as the main sector	656	89.62	1,203	80.74
Paved road	619	84.56	1,345	90.27
Household size, mean $\pm$ SD	4.35 $\pm$ 1.44		4.10 $\pm$ 1.18	
Dependency ratio, mean $\pm$ SD	0.42 $\pm$ 0.12		0.41 $\pm$ 0.12	

Note: ^{a)} The percent values in parentheses represent the percentage of the total number of household observations, respectively, of 732 poor households and 1,490 non-poor households.

The concentration of poverty within the agricultural sector may stem from low capital intensity, commodity price volatility, and credit constraints (Christiaensen & Martin, 2018). Furthermore, infrastructure accessibility, proxied by proximity to paved roads, reveals a clear disparity: 90.27% of non-poor households enjoy such access, compared to 84.56% of poor households. While the percentage gap appears moderate, the impact of physical connectivity is pivotal; road infrastructure facilitates market integration, expands employment opportunities, and lowers the transaction costs associated with formal financial services (Fagbemi et al., 2022). Collectively, these descriptive findings illustrate a cluster of structural disadvantages, larger family sizes, agricultural dependence, and infrastructural deficits that constrain the efficacy of financial inclusion initiatives. Consequently, effective poverty reduction in Indonesia requires an integrated policy framework that synchronizes rural financial expansion with sectoral transformation and infrastructure development.

Table 5 presents the results of the logistic regression analysis estimating the determinants of multidimensional poverty for the sample of 2,222 households. The coefficients are reported as average marginal effects (AME) to facilitate direct interpretation of the changes in the probability of being poor. Robust standard errors were utilized to address potential heteroscedasticity. The results demonstrate that both financial inclusion and financial literacy are robust predictors of multidimensional poverty. Financial deprivation, the inverse of inclusion, is positively associated with poverty; specifically, households characterized by higher financial deprivation have a 5.6 percentage point higher probability of being poor compared to their financially integrated counterparts. Financial inclusion shows an OR of 0.312, indicating that compared to the reference group, those with financial inclusion status have a 0.312 times higher chance of escaping poverty than those with less financial inclusion. Conversely, financial literacy exerts a significant mitigating effect, households with higher financial literacy levels are 6.7 percentage points less likely to experience multidimensional poverty. These findings confirm that both physical access to and the cognitive understanding of financial services are critical for poverty reduction. Financial literacy has a representation of an OR value of -0.374, implying that financial literacy is 0.374 times relatively less likely to be in poverty than those with less literacy.

Alignment with human capital theory, educational attainment significantly reduces the likelihood of poverty at a 1% level, implying that each year of increased education reduces the likelihood of poverty by 0.197 times compared to those who do not increase their education. The relationship between age and poverty status is non-linear, as indicated by a negative and significant relationship for age, implying that increasing age reduces the likelihood of poverty by 0.150 times. Conversely, the squared age has a positive and significant relationship, implying that the squared age increases the likelihood of poverty by 0.001 times compared to those who are still young. This U-shaped relationship indicates that the

likelihood of poverty initially decreases with the head of the household's experience but increases later in life. The calculated inflection point occurs at approximately 50.60 years. Furthermore, household size is positively and significantly related to poverty, implying that household size increases the likelihood of poverty by 0.198 times. Meanwhile, the dependency ratio and marital status are not statistically significant. This suggests that the total number of household members, and not a specific age dependency structure, is the main demographic driver of poverty in this sample.

Table 5. Logistic Estimation Results (n=2,222)

Variables	OR	Marginal effects	95% CI ^{a)}
Financial characteristics			
<i>Financial inclusion (ref. well-off financial inclusion)</i>	0.312	0.056***	0.019 – 0.093
<i>Financial literacy (ref. lack of financial literacy)</i>	-0.374	-0.067**	-0.120 – -0.015
Socio-economic characteristics			
<i>Education</i>	-0.197	-0.035***	-0.040 – -0.030
<i>Marital status (ref. not married/divorced)</i>	0.052	0.009	-0.029 – -0.048
<i>Age</i>	-0.150	-0.027***	-0.037 – -0.017
<i>Age square</i>	0.001	0.002***	0.000 – 0.000
<i>Household size</i>	0.198	0.035***	0.021 – 0.049
<i>Dependency ratio</i>	0.636	0.115	-0.023 – 0.254
Community characteristics			
<i>Industry (ref. Industry is not the main source of business)</i>	-0.309	-0.056***	-0.093 – -0.018
<i>Agriculture (ref. Agriculture is not the main source of business)</i>	0.263	0.047*	-0.007 – 0.332
<i>Market access (ref. access road is not paved)</i>	-0.108	-0.019	-0.072 – 0.033
<i>Region (ref. rural)</i>	-0.578	-0.104***	-0.143 – -0.065

Notes: Term ref. refers to the comparison group (reference group); ***p<0.01, **p<0.05, *p<0.1; and ^{a)} Confidence intervals are taken from the marginal effect estimation results

Among the community-level variables, the presence of the industrial sector as the main source of employment shows a negative and significant relationship with poverty, implying that households engaged in industrial activities are -0.309 times less likely to be poor compared to households in the non-industrial sector. Conversely, agriculture as the main source of livelihood has a positive and significant relationship with poverty, indicating that households dependent on agricultural activities are 0.263 times more likely to be poor. Market access, as measured by the availability of paved roads, is statistically insignificant, indicating that the presence of road infrastructure alone does not significantly change the likelihood of being poor in this context. Finally, living in an urban area significantly reduces the likelihood of being poor, implying that rural households are 0.578 times less likely to experience multidimensional poverty than urban households.

3.2. Discussion

The empirical evidence presented in the preceding section provides a comprehensive assessment of the determinants of multidimensional poverty among Indonesian households. By synthesizing descriptive statistics with marginal effects derived from the logistic regression model, this section situates the findings within the broader context of economic theory, existing literature, and national policy frameworks. Specifically, we examine the socioeconomic mechanisms through which financial inclusion, financial literacy, and structural factors intersect to shape poverty outcomes.

A primary finding of this study is that financial inclusion and financial literacy serve as mutually reinforcing channels for poverty reduction. The results indicate that financial deprivation significantly elevates poverty risk, while enhanced financial literacy reduces the probability of multidimensional poverty by a substantively meaningful margin (approximately 5–7 percentage points). These empirical regularities align with recent cross-country and micro-level scholarship, suggesting that financial integration reduces vulnerability while literacy strengthens the capability to utilize services effectively (Saha & Qin, 2022; Liu et al., 2024). The mechanism through which financial inclusion, defined by the utilization of accounts, savings, credit, and insurance, impacts poverty is primarily through the relaxation of liquidity constraints. Access to formal financial instruments enables households to

smooth consumption in the face of idiosyncratic income shocks and provides secure avenues for capital accumulation (Kumar & Jie, 2023; Lee et al., 2023; and Saha & Qin, 2022). In contrast, financial literacy governs the efficiency of service utilization. It determines whether households select appropriate financial products, manage debt obligations responsibly, and prioritize productive investments over short-term consumption. Our findings support the burgeoning consensus that "access" without "capability" is insufficient; only when households possess the cognitive tools to navigate formal systems can financial inclusion translate into improved non-monetary welfare outcomes, such as health and education security. This suggests that for a significant portion of the Indonesian population, the transition out of poverty is not merely a matter of proximity to a bank, but a matter of human capital optimization in the financial domain.

Evidence from Indonesia and other emerging economies indicates that the most effective poverty-reduction strategies are those that integrate supply-side expansion with demand-side capacity building (Koomson et al., 2023; and Widyastuti et al., 2023). Indonesia's national strategies, which prioritize agent banking, the digitalization of social transfers, and the *Kredit Usaha Rakyat* (KUR) microcredit program, align with global empirical recommendations to expand access while ensuring product suitability. Recent evaluations underscore that directing financial inclusion initiatives toward women and the bottom quintiles, while incorporating behavioral "nudges" or tailored training, significantly increases the likelihood that formal accounts are utilized for productive saving and investment rather than remaining dormant (Inoue, 2024; and Klapper, 2024). This highlights the necessity of moving beyond mere "access" to foster meaningful financial engagement.

Education and age represent two fundamental dimensions of human capital that dictate household resilience to multidimensional poverty. Education is widely recognized as a primary conduit for increasing lifetime earning potential and buffering against economic shocks. Higher educational attainment enhances labor market productivity and facilitates entry into formal employment, thereby reducing both the incidence and depth of poverty (Bukhari et al., 2024; and Harms & Garrett-Ruffin, 2023). Recent scholarship reaffirms that investments in schooling, encompassing both access and learning quality, yield measurable poverty-reducing effects, particularly when curricula translate into marketable skills and stable employment pathways (Beeson et al., 2024). Lifecycle dynamics measured by age add an important layer of nuance to this human capital framework. Poverty risk typically follows a U-shaped trajectory relative to age: it declines as household heads transition from youth to their peak productive years, reflecting the accumulation of experience, professional networks, and physical assets before rising again in late adulthood due to retirement, declining productivity, or asset depletion (Blanchflower, 2021; and Li & Managi, 2023). Our findings substantiate this dynamic, demonstrating a significant negative correlation between poverty and age, coupled with a positive correlation with age-squared. This confirms an inflection point beyond which the protective benefits of aging diminish and vulnerability increases. Such patterns align with recent evidence linking socioeconomic status to the complexities of biological aging (Clark et al., 2021). Consequently, anti-poverty interventions must be age-sensitive, synchronizing youth skill programs with robust social pensions and health financing for the elderly (Li & Managi, 2023).

Household composition simultaneously dictates resource requirements and labor supply capacity. Larger households, particularly those with a high concentration of dependents, face elevated consumption needs while often possessing a lower effective per capita labor supply (Meyer & Nishimwe-Niyimbanira, 2016; and Pinilla-Roncancio et al., 2024). Our descriptive statistics and logit marginal effects confirm that household size is a positive and highly significant predictor of poverty. This is consistent with a broad body of empirical literature suggesting that larger household sizes correlate with increased poverty incidence when economies of scale are limited (Zhao et al., 2024; and Bukhari et al., 2024). Despite the Indonesian government's extensive efforts through programs such as family planning (*Keluarga Berencana* or KB) and social assistance (*Program Keluarga Harapan* or PKH), the persistent positive relationship between household size and poverty suggests critical gaps in policy efficacy. Current initiatives often prioritize direct income transfers rather than addressing the structural drivers of large family sizes. Strengthening community-based family planning, enhancing women's empowerment, and integrating demographic management within poverty alleviation frameworks are essential for achieving sustainable outcomes.

The results indicate that households whose primary economic activity is situated within the industrial sector exhibit a materially lower probability of multidimensional poverty. Industrial and manufacturing employment typically yields higher average productivity and wage premia relative to small-scale agriculture or informal non-farm activities. Industry fosters employment characterized by wage stability and regularity, which enhances income predictability and mitigates vulnerability to seasonal fluctuations. This finding aligns with the literature suggesting that poverty reduction is most effective when growth is driven by industrialization and productivity gains in manufacturing rather than low-productivity sectors (Erumban & de Vries, 2024; and Karahasan, 2023). Conversely, agricultural dependence is associated with a higher risk of poverty. This association is driven by several structural constraints inherent in smallholder agriculture, including land fragmentation, volatile yields, and seasonal underemployment (Do & Nguyen, 2024; and Urfels et al., 2023). These conditions impede the capacity of agricultural households to accumulate assets or invest in human capital, resulting in persistent monetary and non-monetary deprivation.

Furthermore, urban residency significantly reduces the likelihood of poverty, reflecting the structural advantages of urban economies. Urban households benefit from agglomeration economies, superior public infrastructure, and diversified formal employment opportunities (Wardhana et al., 2021; Chen et al., 2023; Qi et al., 2024; Wan et al., 2022). However, the literature also notes that urban poverty persists among informal workers and migrants due to high living costs and inadequate housing (Janz et al., 2023; Zhong et al., 2022). This suggests that while urbanization has a net poverty-reducing effect, its benefits are geographically and socially uneven, necessitating policies that target spatial inequality.

The findings of this study offer several implications for policymakers seeking to effectively reduce poverty in Indonesia. Strengthening inclusive financial systems remains essential, particularly by expanding financial access and literacy among rural and low-income populations to enhance their resilience against income shocks. The government should also reinforce education and skill development programs to improve human capital productivity, especially for households with high dependency ratios. Despite its robust empirical approach, this study has several limitations that warrant consideration. The use of secondary data from IFLS-5, while comprehensive, may not fully capture temporal changes or local heterogeneity in household economic behavior, potentially constraining the generalizability of results. Future research should employ longitudinal or panel data techniques, integrate geospatial and institutional variables, and consider mixed-method approaches to better capture the complex, dynamic, and region-specific mechanisms through which household and contextual factors influence poverty in Indonesia.

4. CONCLUSIONS

This study provides comprehensive empirical evidence on the determinants of multidimensional poverty in Indonesia, highlighting the complex interplay between financial inclusion, human capital, household composition, and spatial dynamics. Our results indicate that enhanced financial inclusion and literacy, paired with higher educational attainment and smaller household sizes, significantly mitigate the probability of poverty. These findings underscore the critical importance of synchronized human capital development and the expansion of formal financial systems as primary drivers of economic resilience. Conversely, households primarily engaged in agriculture and those with larger compositions face heightened poverty risks, reflecting deep-seated structural vulnerabilities within rural and agrarian economies. The analysis further demonstrates that the industrial and urban sectors offer robust poverty-mitigating effects, largely due to superior labor market integration, higher productivity levels, and enhanced access to essential public services. The evidence reinforces the premise that poverty reduction in Indonesia necessitates a multidimensional and context-sensitive policy approach. Such a framework must integrate demographic management, human capital investment, and inclusive economic transformation. Specifically, strengthening social protection mechanisms, improving market accessibility, and fostering equitable urban development are essential to ensuring that macroeconomic growth translates into sustainable poverty alleviation. While these findings offer significant insights for policy design, future research should leverage longitudinal and spatial frameworks to capture the evolving, heterogeneous nature of poverty across Indonesia's diverse socioeconomic landscapes.

Acknowledgment: We thank the researcher in the internal environment of Department of Economics in Universitas Siliwangi who have provided reviews and comments both in the research framework, statistical significant, and substantial significant.

Authors Contribution: A.Y.H. supervised the study and guided the research and manuscript development. J., and I.S. wrote and refined the manuscript. A.M.A. handled general data analysis and interpreted results. N.M.Y. provided critical feedback and helped shape the research and manuscript. A.Y.H., J., M.M., and I.S. supervised the entire research process. All authors reviewed and approved the final manuscript.

Conflict of interest: There is no conflict of interest.

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