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The Effect of Education and Unemployment on Poverty in Indonesia's 34 Provinces (2018–2023): The Mediating Role of the Human Development Index

Salsabila Fayza[1], Rut Afentina Sinambela[2], Rachel Meylani Situmorang[3] Nadya Nafisha[4] Putri Sari Margaret Julianty Silaban[5]
faculty of Economics, Universitas Negeri Medan
email: salsabilafayza21@gmail.com

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Abstract

This study investigates the impact of education and unemployment on poverty across Indonesia's 34 provinces from 2018 to 2023, with the Human Development Index (HDI) serving as a mediating variable. Using secondary panel data and employing path analysis within a fixed effect model framework, the research explores both direct and indirect relationships among variables. The results indicate that unemployment significantly and negatively affects HDI, while education significantly and positively influences HDI. Furthermore, HDI has a significant negative impact on poverty, demonstrating its mediating role in reducing poverty through improvements in education. However, education does not directly influence poverty in a statistically significant manner. In contrast, unemployment directly and positively influences poverty levels. The Sobel test confirms that HDI significantly mediates the effect of education on poverty, but does not mediate the relationship between unemployment and poverty. These findings suggest that enhancing human capital through education can reduce poverty indirectly by improving HDI. However, addressing unemployment requires targeted labor market interventions, as improvements in HDI alone are insufficient to mitigate poverty caused by joblessness. The study underscores the importance of integrated policy approaches that simultaneously enhance education quality and employment opportunities to effectively reduce poverty and promote inclusive development in Indonesia.

1. Introduction

Poverty and unemployment are two major and interconnected economic problems. High levels of unemployment contribute significantly to the persistence of poverty, making it difficult for individuals to find work and earn a sustainable livelihood. This, in turn, affects local production and overall public welfare. According to Sukirno (2004), unemployment is a key factor that reduces societal wealth and well-being, ultimately becoming a major risk factor for poverty.

Conversely, education plays a vital role in improving the quality of human resources. A strong educational background increases an individual's chances of securing decent employment and enhancing career productivity. However, while education can help alleviate poverty, low-quality education and the mismatch between labor market demands and educational outcomes can reduce its effectiveness (Pristiwanti et al., 2022).

A primary metric used to evaluate the quality of human resources in a given region is the Human Development Index (HDI). The HDI assesses life quality through three key components: life expectancy, education, and a decent standard of living (BPS, 2021). Understanding the relationships among HDI, unemployment, education, and poverty is essential for designing effective poverty alleviation strategies.

This study employs HDI as a mediating variable to examine how unemployment and education affect poverty levels across 34 provinces in Indonesia from 2018 to 2023. The relationships among these variables are analyzed using **path analysis**, a technique that extends multiple linear regression by allowing for more complex causal models (Sreiner, 2005). Path analysis enables the estimation of both direct and indirect effects of independent variables on the dependent variable, making it suitable for examining causal relationships (Retherford, 1993).

As defined by Webley (1997), path analysis is an advanced form of multiple regression that seeks to evaluate the significance and magnitude of causal linkages among several variables. It uses diagrams with

arrows to represent causal directions, with each arrow indicating a hypothesized cause-effect relationship. According to Garson (2003), path analysis compares an observed correlation matrix with a model-predicted regression coefficient matrix and performs statistical tests to evaluate the model's fit. Sarwono (2011) emphasizes that path analysis uses path coefficients to assess causal connections over time and estimate the influence of independent variables on dependent variables.

2. Literature Review

2.1. Unemployment Theory

Unemployment refers to the number of individuals in the labor force who are actively seeking work but are unable to find employment (Aceu, 2024). It is a significant economic issue because of its potential to lower productivity and personal income, which in turn contributes to poverty and other social problems. Individuals who are registered as part of the labor force and actively seeking paid employment, but cannot secure a job, are considered unemployed (Abdul Rahman, 2019).

According to Lincoln Arsyad (1997), there is a direct correlation between high unemployment rates and the incidence of poverty. Poverty is generally experienced by individuals who work irregularly or are entirely unemployed. Those with full-time employment are more likely to be financially secure, whereas those who rarely work are at greater risk of poverty. Similarly, Sadono Sukirno (2004) argues that unemployment decreases personal welfare and increases the likelihood of falling into poverty due to the lack of income.

2.2. Educational Theory

The main goal of education is to enhance an individual's ability to reason and think critically. Today, education plays a crucial role in the development of a nation (Pristiwanti et al., 2022). According to Law No. 20 of 2003 on the National Education System, education is defined as a conscious and deliberate effort to create a learning environment and process that enables learners to actively develop their spiritual strength, intellectual abilities, moral integrity, and practical skills for the benefit of themselves, society, the nation, and humanity (Sembiring, 2023).

Slow economic growth, high population rates, and low levels of education can also contribute to poverty. Education acts as a driver and a key component of a country's future development. Quality national development depends heavily on the quality of education. It is through education that a competent generation capable of achieving optimal development is born. Thus, to achieve sustainable development goals, individuals must continuously improve their education levels through professional training and lifelong learning (Amalia, 2017).

2.3. Human Development Index (HDI) Theory

The Human Development Index (HDI) is a tool used to evaluate the level of welfare in a particular region. It aims to improve the well-being of society by measuring three core components: life expectancy and health, education, and a decent standard of living. These components are used to assess the overall quality of life (BPS, 2021).

Limited access to high-quality human resources can lead to poverty. One of the prerequisites for sustainable economic development is the availability of a highly skilled and educated workforce (Sjafi'i & Hidayati, 2009: 68–69). Therefore, improving the HDI is essential to reducing poverty and ensuring equitable development (Meydiasari, 2017).

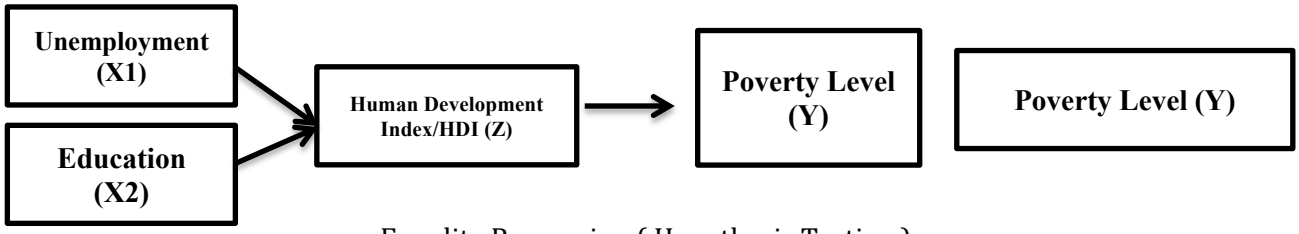
2.4. Poverty Theory

Poverty arises when an individual's or a group's possessions and income fall below the standard of living considered acceptable in society (Anggraini, 2023). This condition negatively affects their self-worth, well-being, and overall quality of life (Suparlan, 1995). A person or household is considered poor when

they are unable to meet their basic needs, such as food, clothing, housing, and other essential social necessities (Ritonga, 2003).

3. Research Methods

The Human Development Index (HDI) is used as a mediating variable in this quantitative study to examine the effect of unemployment (X1) and education (X2) on poverty levels (Y). The analysis is based on data from 34 provinces in Indonesia, covering the period from 2018 to 2023. The data were obtained from official sources, including the Central Bureau of Statistics (BPS). Path analysis was applied to explore the relationships between variables and to test the proposed hypotheses. The analysis began with the Chow test, which identified the Fixed Effect Model (FEM) as the most suitable approach. Subsequently, the Hausman test was conducted to confirm the reliability of the selected model, further validating the choice of FEM. The impact of unemployment and education on poverty was then examined through panel regression analysis, with HDI functioning as the mediating variable. To test whether HDI significantly mediates the relationship between unemployment, education, and poverty, the Sobel test was employed. This test helps determine the statistical significance of the indirect effect through the mediating variable. The results of the analysis are presented in the form of significance values and regression coefficients, which highlight the strength and direction of the relationships between variables. This study focuses on understanding the complex interrelationships among key factors influencing poverty in Indonesia. All data used in this study were collected from secondary sources, primarily the official website of the Central Bureau of Statistics (BPS). The purpose of the quantitative analytical techniques used is to provide a comprehensive explanation and visual representation of the observed relationships in the dataset.



Equality Regression (Hypothesis Testing):

$$Z = \alpha + \beta 1X1 + \beta 2X2 \dots\dots\dots\dots\dots\dots\dots (1)$$

$$Y = \alpha + \beta 1X1 + \beta 2X + \beta 3Z \dots\dots\dots\dots\dots\dots (2)$$

4. Results and Discussion

4.1 Research result

Connection between variable bound and variable independent through intervening/ mediating variable is as following:

(Table 1. Path Analysis Model Selection Using Panel Data)

Testing	Results	Decision
Chow Test	Prob.>0.05	CEM
	Prob.<0.05	**FEM**
Hausman test	Prob.>0.05	BRAKE
	Prob.<0.05	**FEM**
Legrange Multiplier Test (LM Test)	Prob.>0.05	CEM
	Prob.<0.05	BRAKE

1. Chow Test

Redundant Fixed Effects Tests
Equation: Untitled
Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	618.779218	(33,152)	0.0000
Cross-section Chi-square	927.572649	33	0.0000

(Figure 1. Chow Test Results)

According to Chow Test results , Fixed Effect Model (FEM) is the selected model Because mark the probability is 0.0000 (<0.05). Now We Can continue to Hausman test.

2. Hausman test

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	17.029997	3	0.0007

Husman Test Results)

Effect Model Fixed (FEM) has chosen as the model of choice, because The Hausman Test findings show that Prob. value of 0.0007 (<0.05). Because it is known that the model used is FEM, no need switch to LM Test .

4.2 Research Discussion

a. Path Analysis Equation 1

Dependent Variable: IPM
Method: Panel Least Squares
Date: 09/24/24 Time: 19:06
Sample: 2018 2023
Periods included: 6
Cross-sections included: 34
Total panel (unbalanced) observations: 189

Variable	Coefficient	Std. Error	t-Statistic	P
C	71.36141	0.560803	127.2487	0
PENGANGGURAN	-0.159676	0.079286	-2.013927	0
PENDIDIKAN	0.000155	7.11E-05	2.173148	0

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.967437	Mean dependent var	71.5
Adjusted R-squared	0.959988	S.D. dependent var	3.88
S.E. of regression	0.776517	Akaike info criterion	2.50
Sum squared resid	92.25583	Schwarz criterion	3.11
Log likelihood	-200.4057	Hannan-Quinn criter.	2.75
F-statistic	129.8755	Durbin-Watson stat	0.59
Prob(F-statistic)	0.000000		

Analysis Results Equation 1)

- Variables Unemployment (X1) has t- value Statistics of -2.013927 and the value The probability (significance) is 0.0458 (<0.05). This show that Unemployment own significant influence to IPM variable (Z).
- variable (X2) has t- value Statistics of 2.173148 and the value The probability (significance) is 0.0313 (<0.05). This show that Education has significant influence to IPM variable (Z).
- The Adjusted R-Square value of 0.959988 means that contribution influence variable Unemployment (X1) and Education (X2) against IPM variable (Z) is by 95.99%.

b. Results of the Equation Regression Model 1

HDI = 71.361407259 - 0.159675994786*UNEMPLOYMENT +0.000154605314175*EDUCATION

Influence Unemployment (X1) Against HDI (Z)

Human Development Index (HDI) in 34 provinces of Indonesia significantly and negatively affected by unemployment, according to t-test results. Regression analysis shows influence of unemployment in HDI, with significant mark 0.0458 (<0.05) and the value coefficient-0.159676. This result is in line with research conducted by Hamzah et al. (2012) in Indonesia, Basri (2016) in East Java, and Baeti (2013) in Central Java, which found that the level of unemployment had a significant and negative influence on HDI. They argue that high levels of unemployment can influence public welfare because income is very important to encourage human growth. As a result, it may be difficult for those who don't have money to pay their costs and improve other aspects of their life, such as health and education.

The Influence of Education (X2) on Human Development Index (Z)

The results of the t-test on the data revealed that education itself had a positive and significant influence on the Human Development Index (HDI) in 34 provinces of Indonesia. Analysis of regression results show that the HDI is influenced by education, with significant mark 0.0313 (<0.05) and coefficient 0.000155. These results are consistent with research conducted in 2022 by Andra Fadhil Martin, who shows that education in a significant and positive way affects the HDI. In addition, a research conducted in the same year by Nurul Faridah found that higher education can lead to improved knowledge, which in turn can lead to improved production and development results.

***Path Analysis* Equation 2**

Dependent Variable: TINGKATKEMISKINAN
Method: Panel Least Squares
Date: 09/24/24 Time: 19:12
Sample: 2018 2023
Periods included: 6
Cross-sections included: 34
Total panel (unbalanced) observations: 189

Variable	Coefficient	Std. Error	t-Statistic	P
C	23.75949	2.849313	8.338673	0
IPM	-0.198901	0.039741	-5.004970	0
PENGANGGURAN	0.192418	0.039487	4.872899	0
PENDIDIKAN	-1.46E-05	3.55E-05	-0.411994	0

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.995910	Mean dependent var	10.4
Adjusted R-squared	0.994941	S.D. dependent var	5.36
S.E. of regression	0.381708	Akaike info criterion	1.08
Sum squared resid	22.14657	Schwarz criterion	1.71
Log likelihood	-65.56528	Hannan-Quinn criter.	1.34
F-statistic	1027.988	Durbin-Watson stat	1.41
Prob(F-statistic)	0.000000		

(Figure 4. Path Analysis Equation 2)

- variable (Z) has t-Statistic value -5.004970 and value probability (significance) 0.0000 (<0.05). This show that variable Z has significant influence to Poverty Level variable (Y).
- The Adjusted R-Square value of 0.994941 indicates that contribution influence from variable Unemployment (X1), Education (X2), and Human Development Index (Z) against Poverty Level variable (Y) is by 99.49%.

Results of the Equation Regression Model 2

POVERTY LEVEL = 23.7594856347 - 0.198900552797*HDI + 0.192417695414*UNEMPLOYMENT - 1.46287590613e-05*EDUCATION

Influence Unemployment (X1) Against Poverty Rate (Y)

The analysis reveals that unemployment has a positive and statistically significant effect on poverty levels across Indonesia's 34 provinces, with a regression coefficient of 0.1924 and a p-value of 0.0000. This indicates that an increase in unemployment is closely associated with a rise in poverty rates. The result is consistent with findings from Ainunnisa and Riyanto (2019), as well as Oratmangun et al. (2021), who argue that joblessness directly reduces individuals' ability to earn income, thereby limiting their access to basic necessities such as food, housing, education, and healthcare. This economic deprivation ultimately pushes more individuals into poverty. From a theoretical perspective, the result supports the argument put forward by Sukirno (2004), who emphasizes that unemployment leads to a decline in personal and household welfare.

Without sufficient income, individuals cannot maintain an adequate standard of living, which undermines their social and economic security. Moreover, prolonged high unemployment can trigger broader societal issues such as political unrest and social instability, which further exacerbate poverty and hinder national development. Thus, reducing unemployment is a key strategy in breaking the cycle of poverty, as it directly affects household income, welfare, and opportunities for upward mobility.

The Influence of Education (X2) on Poverty (Y)

In contrast to unemployment, education exhibits a negative but statistically insignificant relationship with poverty, with a coefficient of –0.000015 and a p-value of 0.6809. Although the coefficient suggests that higher levels of education are associated with lower poverty rates, the lack of statistical significance implies that, in this context, education alone does not have a measurable impact on reducing poverty.

This finding aligns with studies conducted by Wulandari (2014), Nabawi (2020), and Kurniawan (2018), who observed that in several regions of Indonesia, low educational attainment, coupled with disparities in educational quality, reduce the effectiveness of education in improving individuals' economic conditions. Several contextual factors may explain the limited impact of education on poverty. According to Safitri (2019), variations in regional socioeconomic conditions, public awareness of

education's importance, and disparities in human capital development significantly influence how education translates into economic outcomes. In some areas, even individuals with formal education struggle to find employment that matches their skills, leading to underemployment or informal labor. Despite these challenges, education remains a critical long-term investment that can enhance personal capabilities, foster innovation, and build a skilled workforce. When combined with improved access, quality, and relevance to labor market needs, education can still serve as a powerful tool for poverty alleviation.

The Influence of HDI (Z) on Poverty Level (Y)

The results further indicate that the Human Development Index (HDI) has a strong and negative effect on poverty, with a regression coefficient of –0.1989 and a p-value of 0.0000, confirming its significant role in reducing poverty levels. This finding is supported by empirical studies such as those conducted by Yulianti (2016) and Syaifullah & Malik (2017), which concluded that improvements in human development—measured through health, education, and income dimensions—enhance the population's overall productivity and income-generating capacity (Anggraini, 2023).

Higher HDI scores reflect better life expectancy, educational attainment, and access to a decent standard of living—all of which contribute to economic resilience and self-sufficiency. As human capital improves, individuals are better equipped to participate in formal labor markets, secure stable employment, and make informed decisions about their health, family, and finances. Consequently, enhancing HDI through integrated social policies and development programs becomes a strategic pathway to sustainably reduce poverty and inequality in Indonesia.

Sobel Test Results

- **Calculation Results *Sobel Test* : Influence Variables Unemployment (X1) Against Poverty Level Variable (Y) Through IPM variable (Z)**

	Input:		Test statistic:	Std. Error:	*p*-value:
a	-0.159676	Sobel test:	1.86833935	0.0169989	0.06171479
b	-0.198901	Aroian test:	1.83704715	0.01728846	0.06620294
s_a	0.079286	Goodman test:	1.90128711	0.01670432	0.05726442
s_b	0.039741	Reset all	Calculate		

(Figure 5. Sobel Test Results: Influence Variables Unemployment (X1) Against Poverty Level Variable (Y) Through IPM variable (Z))

The P-Value is 0.06171479 (>0.05), you can concluded that variable unemployment (X1) no influence variable level poverty (Y) in general significant through IPM variable (Z), based on The Sobel Test Statistic value is 1.86833935 . stated that , the IPM variable (Z) does not can functioning as a mediator in connection between variable unemployment (X1) and the level poverty (Y).

- **Calculation Results *Sobel Test* : Influence Education Variable (X2) Against Poverty Level Variable (Y) Through IPM variable (Z)**

	Input:		Test statistic:	Std. Error:	*p*-value:
a	0.000155	Sobel test:	-1.99865826	0.00001543	0.04564534
b	-0.198901	Aroian test:	-1.96594678	0.00001568	0.04930476
s_a	7.11E-05	Goodman test:	-2.03305889	0.00001516	0.04204657
s_b	0.039741	Reset all	Calculate		

(Figure 6. Sobel Test Results: Effect of Education Variable (X1) Against Poverty Level Variable (Y) Through IPM variable (Z))

The P-Value is 0.04564534 (<0.05), you can concluded that variable education (X2) in significant influence level poverty (Y) through IPM variable (Z), with The value of the Sobel Test Statistic is -1.99865826. This result can stated that connection between education (X2) and level poverty (Y) can mediated by the HDI variable (Z).

5. Closing

5.1 Conclusion

This analysis demonstrates that between 2018 and 2023, both unemployment and education significantly influenced poverty levels across 34 provinces in Indonesia, with the **Human Development Index (HDI)** serving as a mediating variable. The findings reveal a **significant and positive relationship** between unemployment and poverty, indicating that higher unemployment rates are associated with increased poverty levels. This supports the hypothesis that poverty is exacerbated by low income caused by a lack of employment opportunities.

Education, on the other hand, has a **significant positive impact** on HDI, which in turn has a **significant negative effect** on poverty. Although the direct relationship between education and poverty is negative, it is not statistically significant; hence, no definitive conclusion can be drawn from that direct link alone. However, the **HDI significantly mediates** the relationship between education and poverty, underscoring the critical role of human development—particularly in health and education—in reducing poverty.

Meanwhile, the **HDI does not mediate** the impact of unemployment on poverty, suggesting that improvements in human development alone are insufficient to reduce the poverty caused by unemployment. This highlights the need for direct interventions targeting job creation. Overall, this study emphasizes the importance of investing in **education quality** and **employment access** as two key pillars in reducing poverty and improving living standards across Indonesia.

5.2 Suggestion

The results of this study provide a strong foundation for understanding the interconnected relationships among unemployment, education, and poverty in the broader context of human development. The finding that unemployment significantly increases poverty highlights the urgent need to develop targeted employment policies that enhance access to decent work and ensure income stability. Furthermore, since education contributes significantly to the Human Development Index (HDI), and HDI, in turn, significantly reduces poverty, enhancing educational access and quality becomes a vital strategy for poverty alleviation. However, the fact that HDI does not mediate the effect of unemployment on poverty suggests that reducing unemployment requires direct interventions, such as vocational training, labor market reforms, and entrepreneurship development programs.

Therefore, it is recommended that policymakers design integrated strategies that simultaneously address both educational and employment challenges. Collaborative efforts across sectors will not only elevate human development outcomes but also contribute to sustainable poverty reduction and overall improvements in quality of life across Indonesia. For future research, it is advisable to expand the model by incorporating additional variables that may influence poverty and development outcomes, such as digital literacy, regional inequality, social protection programs, or infrastructure quality. These additional variables may provide deeper insights and enrich the policy implications for tackling multidimensional poverty in a rapidly changing socioeconomic environment.

Bibliography

Abdul Rahman, M. F. (2019). The influence of education, income and consumption on poverty of migrant communities in Makassar City. *Jurnal EcceS*, 11, 111–129.

Aceu, N. D. R., & Wahyudi, A. W. (2024). The effect of education quality on unemployment rates in Java Island. *Journal of Economics, Management and Social*, 2(1), 26–36.

Anggraini, D., & Irfani, M. (2023). The effect of unemployment on poverty reviewed from an Islamic economic perspective. *Tirtayasa Economics*, 8(1), 123–138.

Badan Pusat Statistik. (2023, November 15). *[New method] Human Development Index by province, 2022–2023*. https://www.bps.go.id/id/statistics-table/2/NDk0IzI=/-metode-baru-indeks-pembangunan-manusia-menurut-provinsi.html

Badan Pusat Statistik. (2023, July 17). *Percentage of poor population by province (percent), 2023*. https://jatim.bps.go.id/id/statistics-table/2/MzQ0IzI=/percentase-penduduk-miskin-menurut-provinsi-.html

Badan Pusat Statistik. (2024, May 6). *Open unemployment rate by province (percent), 2024*. https://www.bps.go.id/id/statistics-table/2/NTQzIzI=/tingkat-pengangguran-terbuka--februari-2024.html

Badan Pusat Statistik. (2024, April 22). *Education completion rate by education level and province, 2021–2023*. https://www.bps.go.id/id/statistics-table/2/MTk4MCMy/tingkat-penyelesaian-pendidikan-menurut-jenjang-pendidikan-dan-provinsi.html

Fadila, R., & Mulyadi, M. (2020). The influence of the human development index (HDI) and economic growth on poverty levels in West Sumatra Province for the period 2013–2018. *EcoGen*, 3(2), 120–133.

Meydiasari, D. A., & Dwisaputra, P. (2017). Analysis of the influence of income distribution, unemployment rate, and government expenditure in the education sector on human development index in Indonesia. *Journal of Economics, Management and Financial Education*, 5(2), 116–126.

Mukhtar, S., & Surya, A. S. (2019). The analysis of the effects of human development index and opened unemployment levels to the poverty in Indonesia. *Ecoplan Journal*, 4(1), 77–89.

Padang, L., & Maulana, M. (2019). The effect of the number of poor population and the open unemployment rate on economic growth in Indonesia. *Indonesian Journal of Economics*, 6(2), 9–16.

Pitaloka, M. D., & Pramesti, P. (2022). The effect of economic growth and poverty on the HDI of 14 districts in the "medium" category in East Java Province. *Journal of Accounting and Economics*, 9(1), 1–12.

Sembiring, C., & Adisaputra, V. A. (2023). The effect of population, education level and unemployment level on poverty in cities of West Java Province. *Scientific Periodic Journal of Efficiency*, 4(1), 25–36.

Suripto, L., & Suryani, S. (2020). The effect of education level, unemployment, economic growth and human development index on poverty in DIY Yogyakarta (2010–2017 period). *Scientific Journal of Development Economics*, 6(3), 127–143.

Suparlan, P. (1995). *Kemiskinan di Perkotaan*. Lembaga Ilmu Pengetahuan Indonesia.

Sjafi'i, M., & Hidayati, S. (2009). *Ekonomi Pembangunan*. LPFE Universitas Indonesia.