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Examining the Factors Influencing Poverty Rates in Central Java Province Dist. and City from 2018 to 2023

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ABSTRACT

Poverty is a complex structural problem and is still a major challenge in regional development, especially in Central Java Province which has a high poverty rate nationally. This study aims to analyze the effect of education, unemployment, labor force participation rate (TPAK), and gender inequality on the poverty rate in 35 districts/cities in Central Java Province during the period 2018-2023. The method used is a descriptive quantitative approach with panel data and Fixed Effect Model (FEM) estimation using Eviews 12 software. The results show that the open unemployment rate variable has a positive and significant effect on poverty. In contrast, the variables of average years of schooling, TPAK, and gender development index show an insignificant effect, although the direction of the relationship is consistent with the theory of development economics. Simultaneously, the four independent variables have a significant effect on poverty with an adjusted R-squared value of 99.46%. This finding confirms the importance of inclusive labor policies and cross-sectoral synergies in sustainable poverty alleviation efforts.

INTRODUCTION

Poverty remains a multidimensional and persistent global challenge that continues to attract extensive scholarly and policy attention, particularly in developing countries such as Indonesia. Poverty reflects a condition in which individuals or households are unable to meet basic needs required to achieve an adequate standard of living, encompassing not only material deprivation but also social exclusion and vulnerability. Contemporary poverty studies emphasize that poverty cannot be reduced solely to income insufficiency, as it is also shaped by limited access to education, healthcare, decent employment, and essential infrastructure, all of which jointly influence human development outcomes (Sen, 1999; Alkire & Foster, 2011; Ravallion, 2016). At the national level, poverty remains a central development issue in Indonesia, as it directly affects social welfare, economic productivity, and the overall quality of human capital (Suryahadi, Suryadarma, & Sumarto, 2020; World Bank, 2023).

Central Java Province, as one of the most populous regions in Indonesia, continues to face substantial challenges in reducing poverty. Despite various development programs, the provincial poverty rate remained above 10 percent until 2023, indicating structural constraints in regional development performance. This outcome did not align with the poverty reduction targets outlined in the 2018–2023 Regional Medium-Term Development Plan, suggesting that poverty in Central Java is driven by deeper and more complex factors than short-term economic fluctuations alone (Juliyanti & Cahyadi, 2025). Regional disparities, uneven access to productive resources, and variations in human

capital accumulation across districts further complicate poverty alleviation efforts (Kanbur & Venables, 2005; Crescenzi & Rodríguez-Pose, 2012).

A growing body of empirical literature has examined the determinants of poverty in Central Java and other Indonesian regions, focusing on indicators such as gross regional domestic product per capita, life expectancy, unemployment rates, educational attainment, infrastructure availability, and healthcare facilities. These studies consistently report that socio-economic factors play a significant role in shaping poverty outcomes at the regional level (Dewi, Indrawati, & Destiningsih, 2020; Suryadarma et al., 2021; Pratomo & Yudhistira, 2023). Economic growth and human development improvements are generally associated with poverty reduction, yet their impacts often vary across regions due to differences in labor market structure and institutional capacity (Fosu, 2017; Bourguignon, 2018).

However, much of the existing literature remains dominated by macroeconomic and social indicators, with relatively limited attention paid to gender inequality as an integral dimension of poverty dynamics. This gap is critical, as gender disparities in education, labor force participation, wage levels, and access to productive assets significantly influence household welfare and long-term poverty trajectories (Duflo, 2012; Klasen, 2018). Empirical evidence suggests that regions with higher gender inequality tend to experience slower poverty reduction due to constrained human capital utilization and reduced labor productivity (Seguino, 2020; Ferrant & Kolev, 2016).

Gender inequality is particularly salient in developing regions where women face structural barriers in accessing education, formal employment, financial services, and healthcare. These barriers often result in lower labor market participation rates, higher informal employment, and increased vulnerability to poverty among women-headed households (Chant, 2010; Grown, Addison, & Tarp, 2016). In rural areas of Central Java, traditional social norms and unequal division of labor further exacerbate gender disparities, limiting women's economic agency and reinforcing intergenerational poverty cycles (Quisumbing et al., 2015; Kabeer, 2021).

From a theoretical perspective, the integration of gender inequality into poverty analysis is consistent with human development and capability approaches, which emphasize equal opportunities and freedom of choice as foundations of sustainable development (Sen, 1999; Robeyns, 2017). Gender Development Index indicators provide a useful analytical framework for capturing disparities between men and women in education, health, and income dimensions, thereby offering a more nuanced understanding of poverty beyond aggregate economic measures (UNDP, 2022; Permanyer, 2015).

Education remains a critical determinant of poverty reduction, as it enhances individual productivity, employability, and adaptive capacity in dynamic labor markets. Numerous studies demonstrate that higher educational attainment is associated with lower poverty incidence and improved income mobility, particularly when combined with inclusive labor market conditions (Barro, 2013; Hanushek & Woessmann, 2020). Similarly, unemployment and labor force participation rates directly influence household income stability and exposure to poverty risks, especially in regions dominated by informal employment sectors (Fields, 2019; ILO, 2023).

Given the interconnections among education, employment, gender inequality, and poverty, a comprehensive analytical approach is required to capture the multidimensional nature of poverty in Central Java. Examining these relationships over the period 2018–2023 enables the identification of both short-term and structural drivers of poverty, while accounting for regional development dynamics and institutional factors (Rodríguez-Pose & Wilkie, 2019; Ascani, Crescenzi, & Iammarino, 2020). Such an approach is essential for understanding why poverty persists despite economic growth and public investment.

This study therefore aims to assess the extent to which socio-economic indicators and gender inequality contribute to poverty levels in Central Java Province and to identify the most dominant determinants influencing poverty outcomes. By incorporating education, unemployment, labor force

participation, and the Gender Development Index into a unified analytical framework, this research seeks to provide a more comprehensive explanation of poverty dynamics at the regional level. The findings are expected to support the formulation of more targeted, integrated, and gender-sensitive poverty alleviation policies aligned with regional development priorities.

The results of this study are expected to contribute to the broader literature on welfare economics and regional development, particularly by enriching empirical evidence on the role of gender inequality in shaping poverty outcomes. By integrating socio-economic and gender-based indicators, this research offers a more holistic perspective on poverty conditions in Central Java Province. Ultimately, a deeper understanding of these dynamics is expected to enhance the effectiveness of poverty reduction strategies, ensure that policy interventions reach vulnerable populations, and support the achievement of poverty reduction targets in accordance with regional development planning objectives.

LITERATURE REVIEW

Structural Poverty Theory

Structural poverty theory explains poverty not merely as a consequence of cultural deficiencies or delays in economic development, but as an outcome of unequal economic and political structures embedded within society. This perspective emphasizes that poverty is systematically produced through institutional arrangements, power relations, and economic systems that limit access to productive resources for certain groups. Individuals who have restricted access to income-generating assets, education, and employment opportunities are structurally constrained from fulfilling their basic needs, thereby increasing their vulnerability to poverty (Sen, 1999; Bourguignon, 2018).

From a political economy standpoint, structural poverty is closely associated with global and national economic dynamics, including market segmentation, unequal development, and uneven distribution of economic growth benefits. In developing regions, structural barriers such as labor market dualism, limited social protection, and regional disparities exacerbate poverty persistence. These conditions prevent marginalized populations from fully participating in economic activities, even during periods of economic growth (Kanbur & Venables, 2005; Ravallion, 2016).

In the Indonesian context, structural poverty manifests through unequal access to education, employment, and infrastructure between urban and rural areas. Individuals with limited access to income sources often struggle to meet basic needs, including food, housing, health services, and education, which ultimately traps them in chronic poverty. This structural condition highlights the importance of policy interventions that address institutional and systemic inequalities rather than relying solely on income-based poverty reduction strategies (Suryahadi et al., 2020; World Bank, 2023).

Poverty

Poverty can be defined as a condition in which individuals or households live below the prevailing welfare standards of society and are unable to meet basic daily needs. This condition is generally characterized by insufficient income that limits access to adequate housing, nutritious food, education, clothing, and healthcare services (Heniyatun, 2023). Poverty is therefore not only an economic issue but also a social condition that affects human dignity and long-term development prospects.

In empirical research, poverty is commonly measured using the poverty headcount ratio, often referred to as the percentage of poor population (P0). This indicator captures the proportion of individuals whose consumption or income falls below the established poverty line. Although widely

used, P0 has limitations, as it does not reflect the depth or severity of poverty experienced by households. Nevertheless, it remains a crucial indicator for monitoring poverty trends and evaluating policy effectiveness (Foster, Greer, & Thorbecke, 1984; Alkire & Foster, 2011).

Recent studies emphasize that poverty should be understood as a multidimensional phenomenon encompassing deprivations in health, education, living standards, and social participation. This broader conceptualization allows policymakers to better identify vulnerable groups and design comprehensive interventions. In this regard, multidimensional poverty frameworks have increasingly been adopted to complement income-based measures, particularly in developing regions (UNDP, 2022; Alkire et al., 2020).

Education

Education refers to a structured and continuous process of learning that is organized according to the developmental stages of learners, the complexity of learning materials, and the methods of instruction employed (Ihsan, 2011). Education plays a central role in enhancing human capital by improving knowledge, skills, and adaptive capacity, which are essential for participation in modern labor markets.

Numerous studies argue that education is one of the most effective instruments for breaking the cycle of poverty. Higher educational attainment increases employment opportunities, income potential, and social mobility, thereby reducing individuals' vulnerability to poverty (Susanto & Pangesti, 2019; Barro, 2013). Education also contributes to non-monetary benefits, such as improved health outcomes and increased civic participation, which further enhance household welfare (Hanushek & Woessmann, 2020).

Empirical evidence consistently supports the negative relationship between education and poverty. Average years of schooling (mean years of schooling) is commonly used as an indicator to measure educational attainment at the population level. Prior studies by Azizah et al. (2018), Didu and Fauzi (2016), and Adhitya et al. (2022) demonstrate that education has a significant effect on reducing poverty levels. These findings are further supported by international research highlighting education as a key determinant of long-term poverty reduction (Psacharopoulos & Patrinos, 2018).

Unemployment

Unemployment refers to individuals of productive age, typically between 15 and 64 years, who are not currently employed, including those who are temporarily not working despite having a job and those actively seeking employment (Purba et al., 2022). Unemployment is widely recognized as one of the most critical economic problems, as it directly affects income stability and household welfare (Wahyuni et al., 2018).

The Open Unemployment Rate is commonly used as an indicator to measure unemployment levels within a region. High unemployment rates indicate inefficiencies in the labor market and limited employment opportunities, which increase the risk of poverty. Individuals who are unemployed often lack sufficient income to meet basic needs, thereby increasing their likelihood of falling into poverty (Sembiring et al., 2023; Fields, 2019).

Empirical studies consistently find a positive relationship between unemployment and poverty. Research by Leonita and Sari (2019), Sari (2021), and Purboningtyas et al. (2020) demonstrates that rising unemployment significantly contributes to increased poverty levels. These findings align with international evidence suggesting that sustained unemployment weakens household resilience and deepens income inequality, particularly in developing economies (ILO, 2023).

Labor Force Participation Rate

The labor force consists of the working-age population that is either employed or actively seeking employment (BPS, 2021). The Labor Force Participation Rate represents the proportion of the labor force relative to the total working-age population and serves as a key indicator of labor market engagement (Christy et al., 2024). A higher participation rate generally reflects greater economic inclusion and utilization of productive labor resources.

However, a large working-age population does not automatically translate into positive labor market outcomes. When job creation fails to keep pace with labor force growth, imbalances emerge that can lead to increased unemployment and underemployment. Such conditions often exacerbate poverty, particularly in regions with limited industrial diversification and weak labor absorption capacity (Erfiana et al., 2025; Todaro & Smith, 2020).

Empirical evidence suggests that labor force participation has a significant relationship with poverty levels. Studies by Sihite et al. (2024) and Handani and Suharianto (2025) find that labor force participation significantly influences poverty outcomes. These findings indicate that policies aimed at improving job quality and labor absorption are essential to ensure that increased participation translates into poverty reduction rather than labor market congestion.

Gender Development

Gender refers to socially constructed differences between men and women in terms of roles, responsibilities, and social status shaped by cultural norms and societal expectations (Fitriyaningsih & Faizah, 2020). These differences are dynamic and evolve over time, reflecting changes in social structures and development processes. Gender equality emphasizes equal opportunities for men and women to access education, employment, health services, and political participation.

Gender equality is widely recognized as a crucial component of sustainable development. Providing equal opportunities for men and women enhances overall socio-economic participation and contributes to national development processes across political, economic, social, and cultural dimensions (Fauziyyah et al., 2022; Klasen, 2018). The Gender Development Index is commonly used to assess gender-based disparities in human development outcomes.

Poverty is closely linked to gender development, as gender inequality often limits women's access to productive resources and decision-making processes. In many developing regions, poverty is associated with low female labor participation and restricted access to political and economic opportunities (Maziyyah & Arif, 2024; Duflo, 2012). Empirical studies by Salam and Wahab (2023) and Amalia (2017) confirm that gender development has a significant impact on poverty reduction. These findings underscore the importance of gender-sensitive policies in addressing structural poverty and promoting inclusive development.

METHODS

This study employs a quantitative research approach, which is designed to examine the relationships among selected variables through empirical testing. The quantitative method is considered appropriate because it enables the measurement of causal relationships between variables using statistical techniques. The data utilized in this study are secondary data obtained from the official website of Statistics Indonesia (Badan Pusat Statistik, BPS) for Central Java Province. The use of secondary data

ensures data reliability and consistency, as the information is collected through standardized national statistical procedures.

The variables analyzed in this study include poverty, education, unemployment, labor force participation rate, and gender inequality. Poverty serves as the dependent variable, while education, unemployment, labor force participation rate, and gender development act as independent variables. The units of analysis consist of all regencies and municipalities within Central Java Province, making this region the object of the study. The selection of Central Java is motivated by its relatively high poverty rate compared to national targets and its socioeconomic diversity across regions.

Based on the structure of the data, this study employs panel data, which combine cross-sectional and time-series dimensions. The cross-sectional units consist of 35 regencies and municipalities in Central Java Province, observed over a six-year period from 2018 to 2023. Panel data analysis allows for more efficient estimation by capturing both inter-regional variation and temporal dynamics, thereby reducing potential estimation bias caused by unobserved heterogeneity.

In panel data estimation, three commonly used models are considered, namely the Common Effects Model (CEM), the Fixed Effects Model (FEM), and the Random Effects Model (REM). To determine the most appropriate estimation model, several specification tests are conducted, including the Chow test to compare CEM and FEM, the Hausman test to choose between FEM and REM, and the Lagrange Multiplier test to compare CEM and REM. These tests ensure that the selected model is statistically appropriate for the data structure.

Furthermore, classical assumption tests are conducted to assess whether the selected model satisfies the BLUE criteria, namely Best, Linear, Unbiased, and Efficient estimator. These tests include examinations of normality, multicollinearity, heteroscedasticity, and autocorrelation. Hypothesis testing is subsequently performed to evaluate the statistical significance of each independent variable in explaining poverty levels in Central Java Province.

The panel regression model applied in this study is specified as follows:

$$Poverty_{it} = \beta_0 + \beta_1 Education_{it} + \beta_2 Unemployment_{it} + \beta_3 LFPR_{it} + \beta_4 GDI_{it} + \varepsilon_{it}$$

More specifically, the empirical model is expressed as:

$$Poverty_{it} = \beta_0 + \beta_1 MYS_{it} + \beta_2 OUR_{it} + \beta_3 LFPR_{it} + \beta_4 GDI_{it} + \varepsilon_{it}$$

where:

Poverty	: Number of poor population (thousand persons)
MYS (Mean Years of Schooling)	: Average years of schooling (percent)
OUR (Open Unemployment Rate)	: Open unemployment rate (percent)
LFPR (Labor Force Participation Rate)	: Labor force participation rate (percent)
GDI (Gender Development Index)	: Gender development index (percent)
β_0	: Constant term
β_1, β_2, β_3, β_4	: Regression coefficients
i	: Cross-sectional units (35 regencies and municipalities in Central Java Province)
t	: Time period (2018–2023)
ε	: Error term

RESULT AND DISCUSSION

Model Selection

The Chow test was conducted to determine whether the Common Effects Model or the Fixed Effects Model was more appropriate. The probability value of the Chow test was 0.0000, which is below the significance level of 0.05. This result indicates that the Fixed Effects Model is preferable to the Common Effects Model.

The Hausman test was subsequently applied to distinguish between the Fixed Effects Model and the Random Effects Model. The test yielded a probability value of 0.0000, which is also below the 0.05 significance level. This result confirms that the Fixed Effects Model is the most appropriate specification for this study. Based on the consistent outcomes of both the Chow and Hausman tests, the Fixed Effects Model was selected as the final estimation model. Therefore, the Lagrange Multiplier test was deemed unnecessary.

Classical Assumption Tests

Multicollinearity was assessed by examining the correlation matrix among independent variables. The results indicate that all correlation coefficients between explanatory variables are below the threshold value of 0.85. Specifically, the correlations among RLS, TPT, TPAK, and IPG range from −0.418218 to 0.647781, suggesting that no serious multicollinearity issue exists in the model. Consequently, the estimated coefficients can be interpreted reliably.

The heteroskedasticity test results show that all independent variables have probability values exceeding the 5 percent significance level. This indicates the absence of heteroskedasticity, implying that the variance of the error terms is constant across observations.

The normality test yields a probability value of 0.237424, which is greater than the 0.05 significance level. This result confirms that the residuals are normally distributed, fulfilling one of the key assumptions of classical linear regression.

Hypothesis Testing

Table 1. Partial t-test Results

Variable	t-Statistic	Probability
Constant	2.517084	0.0128
RLS	0.530452	0.5965
TPT	4.953977	0.0000
TPAK	−1.322228	0.1879
IPG	−1.248547	0.2135

Source: Processed using EViews 12

Table 1 presents the results of the partial hypothesis testing. The education variable, measured by mean years of schooling, exhibits a positive but statistically insignificant effect on poverty. The unemployment variable shows a positive and statistically significant effect on poverty, while labor force participation rate and gender development index display negative but insignificant effects.

Table 2. Simultaneous F-test Results

Statistic	Value
F-statistic	1029.548
Probability	0.000000

Source: Processed using EViews 12

The F-test results indicate that all independent variables jointly have a statistically significant effect on poverty, as reflected by the probability value well below the 5 percent significance level.

Table 3. Coefficient of Determination

Indicator	Value
R-squared	0.9956
Adjusted R-squared	0.9947

Source: Processed using EViews 12

The adjusted R-squared value of 0.9947 indicates that 99.47 percent of the variation in poverty levels can be explained by education, unemployment, labor force participation rate, and gender development index.

Regression Model

Based on the selected Fixed Effects Model, the estimated regression equation is expressed as follows:

$$\text{Poverty} = 242.5216 + 0.9558\text{RLS} + 1.5272\text{TPT} - 0.2002\text{TPAK} - 1.4389\text{IPG}$$

Discussion

Effect of Mean Years of Schooling on Poverty

The empirical results indicate that mean years of schooling exert a positive but statistically insignificant effect on poverty levels in Central Java. This finding deviates from the conventional expectation derived from human capital and structural poverty theories, which posit that increased educational attainment enhances productivity and employment prospects, thereby reducing poverty. The absence of a significant effect suggests that structural constraints beyond schooling duration alone mediate the relationship between education and poverty in Central Java.

One plausible explanation lies in the quality and relevance of education received by the population. Extended years of formal education do not necessarily translate into marketable skills if the education system is not aligned with labor market demands. In regions where curricula emphasize theoretical knowledge over practical competencies, graduates may face difficulties securing stable and well-paying employment. Consequently, education fails to function as an effective mechanism for upward economic mobility, particularly among lower-income households.

Furthermore, the labor market structure in Central Java is characterized by a high proportion of informal and low-productivity employment. Even individuals with relatively longer schooling durations may be absorbed into sectors that offer limited income growth, such as informal services or subsistence-oriented activities. This structural condition weakens the poverty-reducing potential of education and reinforces the persistence of working poverty.

This finding is consistent with previous empirical evidence reported by Lasmini (2022), which highlights that increases in schooling duration alone are insufficient to significantly reduce poverty. It underscores the necessity of complementing educational expansion with improvements in education quality, vocational relevance, and labor market absorption capacity. Without such structural alignment, education may increase human capital in theory but fail to generate tangible welfare improvements in practice.

Effect of Open Unemployment Rate on Poverty

The study finds a positive and statistically significant relationship between the open unemployment rate and poverty, strongly supporting the structural poverty framework. Unemployment represents a critical structural barrier that restricts individuals' access to stable income sources, thereby directly increasing their likelihood of falling into poverty. In this context, unemployment reflects systemic failures in labor market absorption rather than individual shortcomings.

High unemployment rates reduce household income and weaken consumption capacity, which in turn limits access to basic necessities such as food, healthcare, and education. Prolonged unemployment also erodes human capital through skill depreciation and discouragement effects,

further diminishing future employment prospects. These dynamics create a self-reinforcing cycle in which unemployment and poverty mutually exacerbate one another.

The empirical findings align with previous studies by Purboningtyas et al. (2020), which demonstrate that unemployment is one of the most significant drivers of poverty in regional economies. In Central Java, where labor force growth continues to outpace job creation in productive sectors, unemployment emerges as a dominant determinant of poverty levels. This condition highlights the structural imbalance between labor supply and labor demand.

From a policy perspective, these results emphasize the urgency of shifting poverty alleviation strategies toward employment-centered development. Beyond improving workforce skills, policymakers must prioritize the expansion of productive employment opportunities through labor-intensive industries, small and medium enterprise development, and investment-friendly regional policies. Without addressing unemployment structurally, poverty reduction efforts are likely to remain limited in their effectiveness.

Effect of Labor Force Participation Rate on Poverty

The labor force participation rate demonstrates a negative but statistically insignificant relationship with poverty in Central Java. While higher labor force participation theoretically increases income-generating opportunities, the insignificant result suggests that participation alone does not guarantee poverty reduction. This outcome reflects the complexity of labor market dynamics in developing regional economies.

An increase in labor force participation without corresponding job creation may result in higher underemployment or informal employment rather than productive employment. Individuals may be counted as economically active, yet remain engaged in low-wage, unstable, or part-time work that fails to lift them out of poverty. As such, labor force participation becomes a weak indicator of welfare improvement when employment quality is low.

The mismatch between workers' skills and labor market needs further limits the poverty-reducing impact of higher participation rates. When workers lack the competencies demanded by available jobs, increased participation may intensify labor market competition, suppress wages, and exacerbate income insecurity. This condition helps explain why rising participation does not translate into significant poverty reduction.

Consistent with the findings of Cahyani and Robertus (2022), this result underscores the importance of integrating labor force participation policies with strategies aimed at improving job quality and productivity. Enhancing vocational training, promoting sectoral diversification, and supporting industries with high labor absorption capacity are essential to ensure that increased participation contributes meaningfully to poverty alleviation.

Effect of Gender Development Index on Poverty

The Gender Development Index exhibits a negative but statistically insignificant effect on poverty levels in Central Java. This result indicates that improvements in gender development, while theoretically beneficial, have not yet produced a measurable impact on poverty reduction during the study period. This finding does not negate the importance of gender equality but rather highlights the time-lag and structural conditions required for its economic effects to materialize.

Higher gender development reflects improved access for women to education, healthcare, and income opportunities. However, if these improvements are not accompanied by equitable access to productive employment and decision-making power, their influence on household income and poverty

reduction may remain limited. Structural barriers such as occupational segregation and wage disparities may continue to constrain women's economic contributions.

In many regions, including Central Java, women's increased participation in education and health services may not immediately translate into formal employment or entrepreneurship opportunities. As a result, gender development improvements may enhance social outcomes without significantly affecting income-based poverty indicators in the short run. This helps explain the statistically insignificant relationship observed in the study.

The findings align with Supit et al. (2023), who also report an insignificant effect of gender development on poverty. These results suggest that gender-focused policies must be integrated with broader economic reforms, particularly those aimed at expanding decent work opportunities for women. Only through such integrated approaches can gender development function as an effective instrument for sustainable poverty reduction.

CONCLUSION

The empirical findings indicate that the average length of schooling does not have a statistically significant effect on poverty levels across regencies and municipalities in Central Java Province. This result suggests that improvements in formal educational attainment alone are insufficient to directly reduce poverty in the short term. Education primarily functions as a long-term investment in human capital, and its economic returns depend heavily on labor market absorption and the relevance of acquired skills. In regions where employment opportunities are limited or dominated by low-productivity informal sectors, higher educational attainment does not necessarily translate into higher income. Furthermore, a mismatch between educational outcomes and labor market requirements may weaken the role of education in poverty alleviation, highlighting the need for policies that integrate educational improvement with labor market alignment and skills development.

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