

Assessing the Influence of Minimum Wage, Education, and Poverty on the Labor Force Participation Rate: Evidence from Central Java Province

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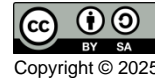
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Abstract

This study aims to analyze the impact of minimum wage, education, and poverty on the labor force participation rate (LFPR) in Central Java Province from 2018 to 2023. Employing an associative quantitative research design, the analysis utilizes a panel regression method with a Fixed Effect Model (FEM). The results indicate that minimum wage has a positive and significant effect on LFPR, while education shows a positive but insignificant effect. Conversely, poverty exerts a negative and significant influence on LFPR. Collectively, minimum wage, education, and poverty significantly affect labor force participation in Central Java during the specified period. These findings provide valuable insights for policymakers aiming to enhance labor market engagement through targeted wage and educational strategies.

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1. Introduction

Economic development is a process that significantly impacts the per capita income of a country's population, characterized by long-term income growth. The primary objective of economic development is to create job opportunities that can accommodate the increasing labor force (Siregar et al., 2023). To achieve this goal, the Indonesian government has formulated the Long-Term Employment Plan (RTKJP) aimed at realizing an "Indonesia Gold 2045," which seeks to establish employment policies that balance various aspects of economic development until 2045. The RTKJP focuses on the labor force participation rate (LFPR), labor demand, and the open unemployment rate (OUR), which are monitored periodically as strategic steps toward achieving sustainable employment development (Kemenaker & BRIN, 2023).

Labor, as a crucial component of employment, plays a vital role in supporting daily economic activities and determining the direction of national development, serving as one of the factors of production (Safitri & Iryani, 2023). In Indonesia, the LFPR has shown an upward trend over the past three years, with data from BPS (2023) indicating an increase from 67.80% in August 2021 to 68.63% in 2022, reaching 69.48% in August 2023. However, despite this increase, certain provinces, such as Central Java, exhibit relatively low participation rates, with an LFPR of only 71.72% in August 2023, which

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remains lower compared to other provinces in Java, Bali, and Nusa Tenggara. This disparity can be illustrated in the following Figure 1.

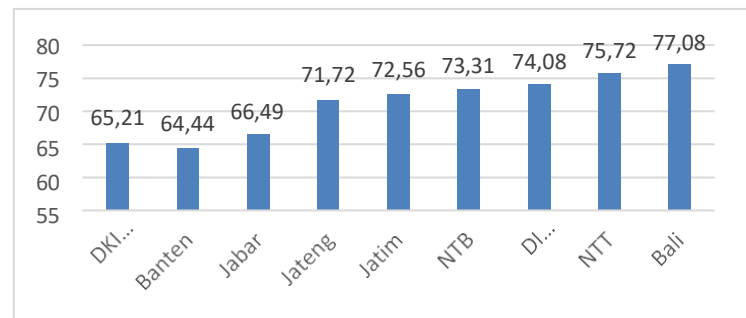


Figure 1. Comparison of LFPR in Central Java. Source: BPS, 2024 (Processed)

The data indicates that Central Java has a relatively low LFPR compared to other provinces. The variations in LFPR can significantly influence the demand and supply of labor in the labor market, with key factors including wages, education, and poverty. Wage levels affect labor force participation, as explained by the natural wage theory, which posits that wages must adjust according to labor demand and supply while meeting the living needs of workers and their families. Despite the annual increase in the minimum wage in Central Java, significant disparities may hinder improvements in LFPR, as low wages can diminish workers' interest in entering the labor force.

From the perspective of education, human capital theory emphasizes that education serves as an investment that enhances labor productivity through skills and knowledge acquisition. This improvement should positively impact LFPR, as more educated workers tend to possess better competitiveness and skills to meet complex job demands (Abidin et al., 2024). In addition to wages and education, poverty is another factor influencing LFPR in Central Java. The poverty trap theory suggests that poverty conditions have a complex and continuous cause-and-effect relationship. According to Azid et al. (2010), poverty, low income of husbands, and women's education increase the labor force participation of married women; furthermore, poverty can decrease the likelihood of remaining in the workforce. The authors are motivated to investigate the influence of minimum wage, education, and poverty on labor force participation in Central Java Province.

2. Literature Review

Labor Force Participation Rate (LFPR)

The Labor Force Participation Rate (LFPR) is a critical metric defined by the Central Statistics Agency (BPS) (2023) as the ratio of the labor force to the working-age population. It serves to quantify the available workforce across demographic segments, including urban-rural divides, educational attainment levels, and gender. The National Labor Force Survey (Sakernas) (2021) further categorizes the labor force into working-age population, labor force, non-labor force, employed population, and open unemployment. Variations in LFPR directly influence labor market dynamics, determining the supply of workers entering the market.

Minimum Wage

The International Labour Organization (2015) defines minimum wage as the remuneration employers must pay workers, irrespective of gender. Research by Menon et al. (2017) highlights that minimum wage policies positively impact LFPR, particularly in rural areas where higher wages attract

more women into the labor market compared to men. This suggests that minimum wage serves as a critical determinant in incentivizing labor participation, especially among underrepresented groups.

Education

Education is conceptualized as a lifelong process aimed at enhancing individual quality and competitiveness in the labor market, rooted in national cultural values (Sujana, 2019). Higher educational attainment correlates with increased labor force participation, as educated individuals command higher incomes and seek better employment opportunities (Fuada & Amar, 2024). This relationship underscores the role of education as a human capital investment, improving employability and workforce quality.

Poverty

Poverty is characterized by the inability to meet basic needs such as food, shelter, and healthcare (Arfiani, 2019; Masrurroh & Zuber, 2014). Studies by Bayar and Degirmenci (2014) indicate that poverty reduces employment likelihood due to limited human capital and high job-search costs. This creates a negative feedback loop, where poverty traps individuals in economic disadvantage, further diminishing labor market participation.

Interrelationships Among Variables

Minimum Wage and LFPR, higher minimum wages increase LFPR by reducing income constraints and incentivizing workforce entry, particularly among women in rural settings (Menon et al., 2017). This aligns with labor supply theory, where wage increases substitute leisure time with work.

Education and LFPR, education positively influences LFPR by enhancing skills and productivity, though its impact may be moderated by structural inequalities in access to quality education (Fuada & Amar, 2024). Higher education levels correlate with higher incomes, motivating individuals to seek formal employment.

Poverty and LFPR, poverty exerts a negative influence on LFPR, as financial constraints and limited opportunities hinder labor market access (Bayar & Degirmenci, 2014). The poverty trap theory posits that this relationship is cyclical, with low LFPR perpetuating poverty.

Collective Impact, minimum wage, education, and poverty interact synergistically to shape LFPR. For instance, minimum wage policies can mitigate poverty's depressive effects on participation, while education may offset structural barriers imposed by poverty (Arwiyati, 2021; Surbakti & Hasan, 2023).

Theoretical Frameworks

Human Capital Theory, emphasizes education as an investment in individual productivity, enhancing labor market competitiveness (Fuada & Amar, 2024).

Natural Wage Theory, links minimum wage to living standards, suggesting that adequate wages sustain workforce participation (Menon et al., 2017).

Poverty Trap Theory, illustrates how poverty creates barriers to employment, perpetuating economic exclusion (Bayar & Degirmenci, 2014).

The interplay between minimum wage, education, and poverty significantly determines LFPR. While minimum wage and education exhibit positive relationships with participation, poverty imposes downward pressure, underscoring the need for integrated policies to enhance labor market inclusion.

3. Methodology

This study employs an associative quantitative research design to examine the influence of minimum wage, education, and poverty on the Labor Force Participation Rate (LFPR) in Central Java

Province, Indonesia, over the period 2018–2023. The analysis utilizes panel regression with a Fixed Effect Model (FEM) to control for unobserved heterogeneity across entities, ensuring robust estimation of the relationships among variables.

Data Collection and Population Sample

The study population comprises 35 regencies/cities in Central Java, with data spanning 2018–2023. Data on minimum wage, education, poverty, and LFPR were sourced from the Central Statistics Agency (BPS) database, ensuring reliability and validity. The selection of variables aligns with their theoretical and empirical significance in labor economics, as supported by prior studies (Abidin et al., 2024; Fuada & Amar, 2024; Bayar & Degirmenci, 2014).

Operational Definitions of Variables

1. Dependent Variable (Y): Labor Force Participation Rate (LFPR)

- Defined as the ratio of the labor force to the working-age population (BPS, 2023). Data were obtained from BPS reports, which categorize labor force participation by demographic segments (urban/rural, education, gender).

2. Independent Variables (X):

- X_1 : Minimum Wage
 - Measured as the provincial minimum wage (UMP) set annually by the Indonesian government (Kementerian Ketenagakerjaan, 2023). Data reflect nominal values for each regency/city from 2018–2023.
- X_2 : Education
 - Operationalized as the average years of schooling among the population aged 15+ years, sourced from BPS (2023). This metric captures human capital investment and aligns with human capital theory (Sujana, 2019).
- X_3 : Poverty
 - Defined as the percentage of the population below the poverty line, measured by BPS using a cost-of-basic-needs approach (Masruroh & Zuber, 2014).

Analytical Method

The study employs panel regression analysis with the Fixed Effect Model (FEM) to assess the influence of minimum wage (X_1), education (X_2), and poverty (X_3) on LFPR (Y). FEM was chosen to address unobserved heterogeneity across regencies/cities, as recommended for panel data with time-invariant characteristics (Basuki & Prawoto, 2019). The regression equation is specified as:

$$Y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \varepsilon_{it}$$

where Y_{it} represents LFPR for regency/city i at time t , and ε_{it} is the error term.

Classical assumption tests, including multicollinearity and heteroskedasticity, were conducted to ensure model validity. Multicollinearity was assessed using correlation matrices, while the Glejser test evaluated heteroskedasticity (Basuki & Prawoto, 2019).

Variable Measurement

- LFPR (Y): Percentage data from BPS, calculated as (Labor Force / Working-Age Population) $\times 100$.
- Minimum Wage (X_1): Nominal values (IDR) from Kementerian Ketenagakerjaan (2023).
- Education (X_2): Average years of schooling, continuous data from BPS (2023).
- Poverty (X_3): Percentage of population below the poverty line, sourced from BPS (2023).

4. Results

Classical Assumptions

According to Basuki and Prawoto (2019), not all classical assumption tests are necessary for each linear regression model using the Ordinary Least Squares (OLS) approach; only multicollinearity and heteroscedasticity tests are required.

The results of the multicollinearity test indicate the correlation values among the independent variables: the correlation between minimum wage (X1) and education (X2) is 0.394697, between minimum wage (X1) and poverty (X3) is -0.409865, and between education (X2) and poverty (X3) is -0.652901. Since all correlation values are less than 0.80, it can be concluded that there are no multicollinearity issues present in the data.

The heteroscedasticity test was conducted using the Glejser test. The results show that the p-values for the independent variables are as follows: X1 = 0.8307 > 0.05, X2 = 0.9104 > 0.05, and X3 = 0.7906 > 0.05. This indicates that the data is free from heteroscedasticity.

Panel Data Regression Analysis

The results from the Fixed Effect Model (FEM) yield the following regression equation:

$$Y_{it} = 65.5 + 0.49X_{1it} + 0.31X_{2it} - 0.69X_{3it} + \varepsilon_{it}$$

The constant obtained is 65.5, indicating that when minimum wage, education, and poverty are held constant, the LFPR is 65.5%.

The coefficient for minimum wage (X1) is 0.49 with a positive sign, suggesting that minimum wage has a positive and significant effect on LFPR (Y). Specifically, a 1 million rupiah increase in minimum wage is associated with a 0.49% increase in LFPR.

The coefficient for education (X2) is 0.31 with a positive sign, indicating that education positively influences LFPR (Y), although the effect is not statistically significant in this model. An additional year of education increases LFPR by 0.31%, but this effect is not significant.

The coefficient for poverty (X3) is -0.69 with a negative sign, indicating that poverty has a negative and significant effect on LFPR (Y). Thus, a 1% increase in poverty is associated with a 0.69% decrease in LFPR.

Hypothesis Testing

t-Test

The coefficient for minimum wage (X1) is 0.49 with a positive sign and a t-statistic of 2.727 > t-table (1.971) with a significance value of 0.0070 < 0.05. Therefore, minimum wage has a positive and significant effect on LFPR (Y).

The coefficient for education (X2) is 0.31 with a positive sign, but the t-statistic is 0.234 < t-table (1.971) and the significance value is 0.8151 > 0.05. Thus, education has a positive but insignificant effect on LFPR (Y).

The coefficient for poverty (X3) is -0.69 with a negative sign, with a t-statistic of -2.299 < t-table (1.971) and a significance value of 0.0227 < 0.05. This indicates that poverty has a negative and significant effect on LFPR (Y).

F-Test

The F-statistic obtained is 9.039141 > F-table (2.65) with a significance value of 0.000000 < 0.05. This indicates that minimum wage, education, and poverty collectively have a significant effect on the labor force participation rate.

Coefficient of Determination (R²)

The adjusted R² value is 0.660380, indicating that 66.04% of the variation in LFPR is explained by minimum wage, education, and poverty. The remaining 33.96% is influenced by other variables not discussed in this study.

5. Discussion**The Influence of Minimum Wage on Labor Force Participation Rate in Central Java**

The results of the t-test indicate that minimum wage has a positive and significant effect on the labor force participation rate (LFPR) in Central Java. This finding aligns with the conclusions drawn by Aditiya and Wildana (2023). When minimum wage is linked to LFPR, minimum wage policies encourage workers to enter the labor market (Sarsi et al., 2014). According to labor supply theory, the substitution effect suggests that an increase in wages incentivizes more individuals to work, as employment becomes more profitable compared to leisure time. As wages rise, individuals' motivation to join the labor market also increases, as higher wages can meet their family's needs, consistent with the natural wage theory. In this context, the provincial minimum wage (UMP) in Central Java has increased annually from IDR 1,486,065 in 2018 to IDR 1,958,169.69 in 2023, prompting workers to participate in the labor market as wages rise, thereby sacrificing their leisure time for work.

The Influence of Education on Labor Force Participation Rate in Central Java

The results indicate that education has a positive but insignificant effect on LFPR, leading to the rejection of the initial hypothesis. This finding is supported by Yuliana (2018), who also found that education positively influences LFPR but lacks statistical significance. Human capital theory posits that education serves as an investment; individuals with higher education levels tend to have better productivity and competitiveness in the labor market. According to BPS (2023), the average length of schooling in Central Java has increased from 7.35 years in 2018 to 8.1 years in 2023. However, this figure remains below 12 years, indicating that many individuals do not complete their education beyond junior high school, which may limit their competitiveness in the labor market.

The Influence of Poverty on Labor Force Participation Rate in Central Java

The analysis reveals that poverty has a negative and significant effect on LFPR. This finding is consistent with the research conducted by Faridi et al. (2016), which indicates an inverse relationship between labor force participation and poverty; as labor force participation increases, poverty tends to decrease, and vice versa. This relationship aligns with the poverty trap theory. In Central Java, poverty levels have fluctuated from 2018 to 2023, with an increase from 2019 to 2021, followed by a decrease in 2022 and 2023. The decline in poverty suggests that the population of Central Java is beginning to escape the poverty trap, which also allows more individuals to access better education and skills training, as well as other supportive facilities that facilitate entry into the labor market.

The Combined Influence of Minimum Wage, Education, and Poverty on Labor Force Participation Rate

The results indicate that, collectively, minimum wage, education, and poverty significantly influence LFPR. This finding supports the initial hypothesis. Additionally, research by Arwiyati (2021) confirms that poverty, education, and wages simultaneously affect women's labor force participation. Furthermore, Surbakti and Hasan (2023) also found that education and wages jointly influence LFPR.

There are both internal and external factors that can affect LFPR. From the education perspective, individuals with higher educational attainment are more likely to participate in the labor market, as they possess the skills necessary to compete, which serves as an internal motivator. Conversely, minimum wage is considered an external factor, as wage levels are determined by prevailing policies, such as labor regulations and laws. When wages increase, more individuals are likely to enter the labor

market, in line with labor supply theory. On the other hand, individuals trapped in poverty face challenges in accessing decent employment due to economic conditions and social environment, which are external factors. When individuals have favorable economic conditions, including savings and investments, they are more likely to access decent jobs, supported by good educational access and high productivity. Thus, minimum wage, education, and poverty are interrelated factors that collectively influence labor force participation rates.

Policy Implications and Recommendations

The findings of this study highlight several important policy implications that can enhance labor force participation in Central Java. First, it is crucial for the government to strengthen minimum wage policies by implementing regular reviews and adjustments to ensure that wages are competitive and reflective of the cost of living. This approach will encourage more individuals to enter the labor market, thereby increasing the labor force participation rate (LFPR). Additionally, there is a pressing need to improve access to quality education across all districts in Central Java. By investing in educational infrastructure and programs, the government can ensure that individuals are better equipped with the skills necessary to compete in the labor market. This will not only enhance the employability of the workforce but also contribute to overall economic growth. Furthermore, addressing poverty should be a priority in policy formulation. Initiatives aimed at reducing poverty, such as social safety nets and skill development programs, can empower individuals to seek employment opportunities. By tackling these interconnected issues – minimum wage, education, and poverty – the government can create a more inclusive labor market that fosters higher participation rates and ultimately contributes to sustainable economic development in the region.

6. Conclusion

This study concludes that minimum wage has a positive and significant impact on the labor force participation rate (LFPR) in Central Java. In contrast, education shows a positive but insignificant effect on LFPR, while poverty exerts a negative and significant influence on participation rates. Collectively, minimum wage, education, and poverty significantly affect LFPR in Central Java.

Based on these findings, it is recommended that the government, as the policymaker, should focus on enhancing access to education across all cities and regencies in Central Java. This effort aims to ensure equitable educational opportunities and improve the competitiveness of the workforce in the labor market. Additionally, future researchers are encouraged to incorporate other variables that may provide a clearer understanding of the factors influencing labor force participation rates.

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