

Research Article

The Effect of Female Labor Force Participation Rate, Average Years of Schooling for Women, and Gender Inequality Index on Economic Growth in Indonesia: Panel Data Analysis 2018-2024

Putri Permata Liza ^{1*}, Ambya ²

¹ Faculty of Economics and Business, Universitas Lampung; Indonesia: permataliza01@gmail.com

² Faculty of Economics and Business, Universitas Lampung; Indonesia: ambya@gmail.com

* Corresponding Author: permataliza01@gmail.com

Abstract. This research examines the impact of the Female Labor Force Participation Rate (FLFPR), women's average years of schooling, and the Gender Inequality Index on economic growth in Indonesia during 2018-2024, with investment included as a control variable. The study uses a quantitative explanatory method and applies panel data regression analysis covering 13 provinces in Indonesia. To identify the most suitable estimation model, the Chow test, Hausman test, and Lagrange Multiplier test were performed, and the Fixed Effect Model (FEM) was ultimately chosen. The findings reveal that FLFPR and investment significantly contribute to economic growth in a positive direction. In contrast, women's average years of schooling shows a positive relationship but does not significantly influence economic growth. Meanwhile, the Gender Inequality Index is found to have a significant negative relationship with economic growth. Overall, the results imply that stronger female participation in the workforce and lower levels of gender inequality can support higher economic growth in Indonesia.

Keywords: Economic Growth; Female Labor Force Participation Rate; Gender Inequality Index; Panel Data Regression; Women's Education.

1. INTRODUCTION

Modern economic development is no longer solely oriented toward increasing economic growth, but also emphasizes equitable and inclusive development. In this context, gender equality has become an important issue because it is closely related to the optimal utilization of human resources and the sustainability of economic development (Afni et al., 2022). Through the Sustainable Development Goals (SDGs), gender equality has been established as one of the main global development goals, as gender inequality is considered a barrier to public welfare and overall economic performance (Altuzarra et al., 2021).

Women play a strategic role in supporting economic development, particularly through labor force participation and the improvement of human resource quality. However, women's labor force participation rate in Indonesia remains lower than that of men. According to data from the Central Bureau of Statistics (BPS), the Female Labor Force Participation Rate (FLFPR) during the 2018-2024 period ranged from 51-54 percent, while the male participation rate consistently remained above 80 percent (BPS, 2024). This indicates that women continue to face social and structural barriers in accessing productive and decent employment opportunities (Deris et al., 2022). The relatively low involvement of women in economic activities causes productive labor potential to remain underutilized, which may ultimately affect regional economic output.

In addition to labor force participation, women's education is also an important factor influencing economic development. Education improves skills, productivity, and workforce quality, thereby increasing women's opportunities to contribute to economic activities (Devi

Received: April 24, 2026

Revised: April 30, 2026

Accepted: May 28, 2026

Published: May 30, 2026

Curr. Ver.: May 30, 2026



Copyright: © 2025 by the authors.
Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY SA) license (<https://creativecommons.org/licenses/by-sa/4.0/>)

& Ifthianah, 2024). BPS data show that the average years of schooling for women increased from 7.72 years in 2018 to 8.48 years in 2023, although it remains below the male average (BPS, 2024). This educational disparity may affect the quality of female labor and limit women's contribution to regional economic activities (Irawan et al., 2024).

Furthermore, gender inequality in Indonesia remains relatively high. Indonesia's Gender Inequality Index (GII) in 2022 was recorded at 0.459, indicating persistent disparities between men and women in health, education, and economic participation (BPS, 2024). High levels of gender inequality may lead to the underutilization of women's human resource potential, thereby hindering regional economic development (Srihaeni et al., 2024).

Besides gender-related factors, investment is also considered an important determinant of regional economic development. Investment can increase production capacity, create employment opportunities, and stimulate economic activities across various sectors. Therefore, this study incorporates investment as a control variable to obtain a more accurate estimation of the influence of the main variables on Gross Regional Domestic Product (GRDP) per capita (Nehemia & Prasetyia, 2023).

Several previous studies have highlighted the strong relationship between gender equality and economic growth. A study by Altuzarra et al. (2021) showed that better gender equality in education can encourage higher economic growth. Likewise, Deris et al. (2022) found that women's education and participation in the labor force have a positive contribution to economic growth in Indonesia. On the hand, research conducted by Yati & Rosyadi (2025) indicated that higher gender inequality tends to reduce regional economic growth.

However, many earlier studies mainly examined only one aspect of gender, such as female labor force participation or women's education. In addition, most of these studies used data from the period before the COVID-19 pandemic and focused only on certain regions. In reality, the pandemic has brought major changes to labor market dynamics and patterns of economic development. As a result, studies that simultaneously analyze the Female Labor Force Participation Rate, women's average years of schooling, and the Gender Inequality Index using recent panel data are still relatively limited.

The main contribution of this research is the use of three gender-related indicators at the same time within a panel data framework covering the post pandemic period in 13 Indonesia provinces with relatively high gender inequality levels. Therefore, this study seeks to examine the influence of the Female Labor Participation Rate, women's average years of schooling, and the Gender Inequality Index on GRDP per capita during 2018-2024, while also including investment as a control variable.

2. LITERATURE REVIEW

Neoclassical Growth Theory

According to the neoclassical growth theory by Solow, (1956), economic growth is driven by several key factors, including capital formation, labor availability, and technological advancement (Todaro, 2009). Based on this perspective, increasing women's participation in the workforce and improving their access to education can contribute positively to productivity and overall economic performance. On the other hand, persistent gender inequality may limit the effective use of women's potential, which can ultimately hinder economic growth (Deris et al., 2022).

Female Labor Force Participation and Economic Growth

The Female Labor Force Participation Rate (FLFPR) refers to the proportion of women of working age who are economically active, either through employment or job seeking activities (Borjas George, 2016). Greater female participation in economic activities is expected to improve labor productivity and contribute to economic growth. Previous studies by Deris et al. (2022) and Jewaru & Meilawijaya, (2024) reported that female labor force participation has a positive relationship with economic growth.

Women's Education and Economic Growth

Human capital theory views education as an important investment that enhances workforce quality and productivity (Todaro & Smith, 2014). Women's educational attainment is expected to improve labor quality and support sustainable economic growth. Studies conducted by Altuzarra et al. (2021) and Deris et al. (2022) found that improvements in women's education positively contribute to economic performance.

Gender Inequality and Economic Growth Gender

The United Nations Development Programme Gender Inequality Index (GII) is an indicator used to assess the gap between women and men in aspects such as health, education, and participation in economic activities (UNDP, 2025). A higher level of gender inequality can limit women's involvement in productive sectors of the economy, which may eventually slow economic growth. This finding is consistent with the study Yati & Rosyadi (2025) which reported that gender inequality tends to have a negative effect on regional economic performance.

Investment and Economic Growth

Investment refers to expenditures on capital goods used to support production activities and increase economic capacity (Mankiw, 2021). Previous studies by Nehemia & Prasetyia (2023) showed that investment positively affects inclusive economic growth in Indonesia. Therefore, investment is included as a control variable in this study.

Research Gap

Most previous studies have examined gender-related variables separately and were generally limited to certain regions or the period before the COVID-19 pandemic. Therefore, this study combines the Female Labor Force Participation Rate, women's average years of schooling, and the Gender Inequality Index using panel data from 13 provinces in Indonesia during the 2018–2024 period while also incorporating investment as a control variable.

3. RESEARCH METHOD

This study employs a quantitative approach using panel data analysis to examine the relationships among the research variables. A quantitative approach was selected because all variables are measured numerically and analyzed using statistical methods.

Data and Data Sources

This research uses secondary data collected from Badan Pusat Statistik and other official sources relevant to the study. The data are arranged in panel form, covering 13 provinces in Indonesia over the 2018–2024 period.

In this study, Gross Regional Domestic Product (GRDP) per capita is used as the indicator of economic growth and serves as the dependent variable. The explanatory variables consist of the Female Labor Force Participation Rate (FLFPR), women's average years of schooling, and the Gender Inequality Index (GII). To strengthen the estimation results, investment is also included in the model as a control variable.

Data Analysis Technique

This research applies panel data regression analysis since the method integrates cross-sectional and time series data into one analytical model. By using panel data, the study is able to observe differences between regression as well as changes occurring over time simultaneously.

The panel regression model used in this study is formulated as follows:

$$GDRB_{it} = \alpha + \beta_1 FLEPR_{it} + \beta_2 AYS_{it} - \beta_3 GII_{it} + \beta_4 INVESEMENT_{it} + \varepsilon_{it}$$

Where:

- $GDRB_{it}$** = Gross Regional Domestic Product per capita Ln(Rupiah)
- $FLFPR_{it}$** = Female Labor Force Participation (%)
- AYS_{it}** = Women's Average Years of Schooling (Year)
- GII_{it}** = Gender Inequality Index Ln(Index)
- $INVESEMENT_{it}$** = Investment Ln(Rupiah)
- ε_{it}** = error term

To determine the most suitable panel data regression model, this study employed the Chow test, Hausman test, and Lagrange Multiplier test. After identifying the best model, it was used to analyze the effect of the independent variables on economic growth.

4. RESULTS AND DISCUSSION

Descriptive Statistic

Table 1 presents the descriptive statistics of the variables used in this study. During the 2018–2024 period, the average economic growth in 13 provinces in Indonesia was 4.49 percent. The Female Labor Force Participation Rate (FLFPR) had an average value of 52.04 percent, while women's average years of schooling reached 8.11 years. In addition, the average value of the Gender Inequality Index (GII) was -0.675, and the average investment value was 8.99.

Table 1. Descriptive Statistical Analysis Results

	GDRB	FLFPR	AYS	GII	INVESMENT
Mean	4.49	52.04	8.11	-0.675	8.99
Median	4.53	51.69	8.08	-0.653	9.08
Maximum	4.92	70.40	11.40	-0.532	11.52
Minimum	4.08	42.25	5.88	-0.970	5.53
Std. Dev.	-0.03	5.28	0.92	0.084	1.28

Source: Output Eviews 12

Panel Data Model Selections

The Chow test and Husman test were used to identify the most suitable panel data regressions model. The Chow test generated a probability value of 0.0000, whereas the Husman test resulted in a probability value of 0.0006. because both values are below the 5% significance level, the Fixed Effect Model (FEM) was considered the most appropriate model for this research.

Table 2. Panel Data Model Selection Results.

Test	Probability	Decision
Chow Test	0.0000	FEM
Husman Test	0.0006	FEM

Source: Output Eviews 12

Classical Assumption Tests

Based on the Jarque-Bera normality test, the probability value obtained was 0.219863, which indicates that the residual data are normally distributed. The multicollinearity test results further show that the independent variables do not have a high correlation with one another. Moreover, the heteroscedasticity test produced probability values greater than 0.05 for all variables, suggesting that heteroscedasticity is not present in the regression model.

The Durbin-Watson test generated a value of 1.4179, indicating the presence of positive autocorrelation. However, according to Porter & Gujarati (2009), autocorrelation is generally more relevant in time-series analysis than in panel data analysis.

Regression Results**Table 3.** Regression estimation results using the Fixed Effect Model.

Variable	Coefficient	Probability
FLFPR	0.002124	0.0136
ASY	0.001876	0.4562
GII	- 0.107653	0.0000
INVESTMENT	0.030189	0.0000

Table 4. R-squared results and F-statistic test.

Model Statistics	Value
Adjusted R-squared	0.996650
Prob (F-statistic)	0.000000

Source: Output Eviews 12.

The regressions results show that the Female Labor Force Participation Rate (FLFPR) positively and significantly influences economic growth. This indicates that higher participation of women in the workforce can contribute to increased productivity and better regional economic outcomes. The result is consistent with the study conducted by Deris et al. (2022), which found that women's labor force participation contributes positively to economic growth in Indonesia.

On the other hand, women's average years of schooling shows a positive but statistically insignificant effect on economic growth. This condition indicates that improvements in women's educational attainment have not yet been fully accompanied by stronger economic performance. This may be related to limited access to employment opportunities that match educational qualifications as well as the dominance of low-productivity informal sector employment. This finding differs from the results reported by Altuzarra et al. (2021), who found that women's education has a significant contribution to economic growth.

Furthermore, the Gender Inequality Index (GII) is found to have a negative and significant effect on economic growth. This result implies that higher levels of gender inequality reduce women's participation in productive economic activities due to limited access to education, healthcare, and economic opportunities. The finding supports the studies conducted by Yati & Rosyadi, (2025), which stated that gender inequality may hinder regional economic growth.

In addition, investment has a positive and significant influence on economic growth. Higher investment is considered capable of expanding production capacity, generating employment opportunities, and stimulating regional economic activities, thereby supporting economic growth. This result is also in line with the findings of Nehemia & Prasetyia, (2023), which showed that investment contributes positively to economic growth in Indonesia. Simultaneously, all independent variables in this study significantly affect economic growth, as indicated by the Prob(F-statistic) value of 0.000000.

In addition, the Adjusted R-squared value of 0.996650 shows that around 99.66 percent of the changes in economic growth are explained by the variables used in this model, whereas the remaining percentage is affected by other variables not included in the analysis.

5. Conclusions

This research analyzes how the Female Labor Force Participation Rate (FLFPR), women's average length of schooling, and the Gender Inequality Index (GII) are related to economic growth in Indonesia during the study period. 2018-2024 period using panel data regression analysis. The findings reveal that FLFPR and investment positively and significantly affect economic growth. This suggest that higher participation of woman in the labor market, supported by increased investment, can improve productivity, expand production capacity, and simulate regional economic activities.

On the other hand, women's average years of schooling shows a positive but insignificant relationship with economic growth. This condition may be related to the dominance of informal employment and the limited availability of jobs that correspond to women's educational backgrounds. Furthermore, the Gender Inequality index has a negative and significant effect on economic growth, which indicates that greater gender inequality can reduce the effective use of women's human capital.

Taken together, all independent variables simultaneously show a significant effect on economic growth in Indonesia. The findings indicate that gender-related aspects contribute to economic development, particularly through higher participation of women in the workforce, improved educational achievement among women, and lower levels of gender inequality.

REFERENCES

- Afni, N., Rezal, M., & Latoki, L. (2022). Konsep kesetaraan gender dalam pembangunan dan pemberdayaan ekonomi masyarakat. *Musawa: Journal for Gender Studies*, 14(1), 19–48. <https://doi.org/10.24239/msw.v14i1.980>
- Altuzarra, A., Gálvez-Gálvez, C., & González-Flores, A. (2021). Is gender inequality a barrier to economic growth? A panel data analysis of developing countries. *Sustainability*, 13(1), 1–21. <https://doi.org/10.3390/su13010367>
- Badan Pusat Statistik. (2024a). *Indeks ketimpangan gender (IKG)*. <https://www.bps.go.id/id/statistics-table/2/MjE5NiMy/indeks-ketimpangan-gender--ikg-.html>

- Badan Pusat Statistik. (2024b). *Rata-rata lama sekolah (RLS) menurut jenis kelamin*. <https://www.bps.go.id/id/statistics-table/2/NDU5IzI%3D/rata-rata-lama-sekolah--rls--menurut-jenis-kelamin--tahun-.html>
- Badan Pusat Statistik. (2024c). *Tingkat partisipasi angkatan kerja menurut jenis kelamin*. <https://www.bps.go.id/id/statistics-table/2/MjIwMCMY/tingkat-partisipasi-angkatan-kerja-menurut-jenis-kelamin.html>
- Borjas, G. J. (2016). *Labor economics* (7th ed.). McGraw-Hill Education.
- Deris, L., Bhinadi, A., & Nuryadin, D. (2022). Pengaruh ketimpangan gender terhadap pertumbuhan ekonomi di Indonesia (34 provinsi) tahun 2015–2020. *SIBATIK Journal: Jurnal Ilmiah Bidang Sosial, Ekonomi, Budaya, Teknologi, dan Pendidikan*, 1(12), 2947–2958. <https://doi.org/10.54443/sibatik.v1i12.481>
- Devi, Y., & Iftihanah, L. H. (2024). Pengaruh rata-rata lama sekolah dan tingkat partisipasi angkatan kerja terhadap kesenjangan gender di Indonesia tahun 2018–2022 ditinjau dari ekonomi Islam. *Jurnal Ilmiah Mahasiswa Perbankan Syariah (JIMPA)*, 4(2), 549–566. <https://doi.org/10.36908/jimpa.v4i2.440>
- Gujarati, D. N., & Porter, D. C. (2009). *Basic econometrics* (5th ed.). McGraw-Hill Education.
- Irawan, P. S., Agustian, F. D., & Lestarikan, D. P. (2024). Identifikasi faktor-faktor yang mempengaruhi kesenjangan gender dalam akses dan partisipasi pendidikan tinggi di Indonesia. *Jurnal Kajian Hukum dan Kebijakan Publik*, 2(1), 493–500.
- Jewaru, & Meilawijaya. (2024). Pengaruh ketimpangan gender terhadap pertumbuhan ekonomi. *Jurnal Statistika Terapan*, 4(2), 55–68. <https://doi.org/10.64930/jstar.v4i2.72>
- Mankiw, N. G. (2021). *Principles of economics* (9th ed.). Cengage Learning.
- Nehemia, S. D., & Prasetyia, F. (2023). Analisis pengaruh penanaman modal dalam negeri dan penanaman modal asing terhadap pertumbuhan ekonomi inklusif di Indonesia. *Journal of Development Economic and Social Studies*, 2(1), 26–37. <https://doi.org/10.21776/jdess.2023.02.1.3>
- Solow, R. M. (1956). A contribution to the theory of economic growth. *The Quarterly Journal of Economics*, 70(1), 65–94. <https://doi.org/10.2307/1884513>
- Srihaeni, Fajar, A. H. Al, Mudfainna, Syamraeni, & Sari, N. (2024). Peran kesetaraan gender dalam meningkatkan produktivitas SDM dan pertumbuhan ekonomi. *Tafkirul Iqtishodiyah*, 4(2), 18–29. <https://doi.org/10.63761/jti.v4i2.112>
- Todaro, M. P. (2009). *Economic development* (10th ed.). Addison-Wesley.
- Todaro, M. P., & Smith, S. C. (2014). *Economic development* (12th ed.). Pearson Education.
- United Nations Development Programme. (2025). *Gender inequality index (GII)*. Human Development Reports. <https://hdr.undp.org/data-center/thematic-composite-indices/gender-inequality-index#/indicies/GII>
- Yati, M., & Rosyadi, R. (2025). Pengaruh ketimpangan gender dan pembangunan gender terhadap pertumbuhan ekonomi di Kalimantan Barat. *Journal of Economics and Business UBS*, 14(1), 81–99. <https://doi.org/10.52644/joeb.v14i1.2544>