

Research Article

# The Influence of Education Level and Labor Force Participation Rate (LFPR) on the Gender-Based Open Unemployment Rate in Aceh Province

Liza Syahwi\*, M. Rasyidin, M. Saleh

Universitas Almuslim, Bireuen, Aceh, 24261, Indonesia

\*Corresponding Author: [lizasyahwi17@gmail.com](mailto:lizasyahwi17@gmail.com)

## ABSTRACT

This study analyzes the influence of education level and labor force participation rate (LFPR) on the gender-based open unemployment rate in Aceh Province during the period 2015–2024. Using multiple linear regression (OLS), the study evaluates the structural relationship between education, labor participation, and unemployment while considering gender aspects. The estimation results indicate that education level has a significantly negative effect on open unemployment, while LFPR has a significantly positive effect. The coefficient of determination ( $R^2$ ) values of 0.63 for the male model and 0.8 for the female model suggest that education and LFPR variables can explain most of the variation in open unemployment rates in Aceh. The gender analysis reveals that although female labor participation is lower, their unemployment rate fluctuates more than that of males. The novelty of this study lies in its simultaneous gender-based regional analysis, which enriches the empirical literature on labor in Aceh. The findings recommend strengthening vocational education and implementing gender-responsive labor policies to reduce unemployment and narrow disparities in the labor market.

**Keywords:** Education; Labor Force Participation Rate (LFPR); Open Unemployment; Gender; Aceh

## 1. INTRODUCTION

Unemployment remains a major structural challenge in Aceh Province, reflecting an imbalance between labor supply and labor market demand. The high unemployment rate indicates that a significant portion of the working-age population has not been optimally absorbed, largely due to low levels of education and labor force participation (LFPR). This phenomenon also highlights weaknesses in Aceh’s structural economic transformation, where the growth of the labor force is not matched by the creation of formal employment opportunities. Data from the Central Bureau of Statistics (BPS) show that Aceh’s unemployment rate has consistently been higher than the national average, indicating the need for strategies to improve human resource quality and promote regional economic diversification (World Bank, 2023; Rahman et al., 2022). However, studies that simultaneously and separately examine the influence of these variables based on gender, particularly in Aceh, remain very limited. In 2024, the open unemployment rate (OUR) was recorded at 5.75%, reflecting a gap between the growing labor force and the limited availability of job opportunities, according to data released by the Central Bureau of Statistics (BPS).

**Table 1.** Open Unemployment Rate of Males and Females, 2015–2024

TPT Province of Aceh

Year	Male %	Female %
2015	6,86	8,27
2016	6,48	8,02
2017	6,43	7,96
2018	6,30	7,84
2019	6,41	7,88
2020	6,49	3,91
2021	5,85	7,01
2022	5,39	6,99
2023	5,61	5,98
2024	5,38	5,88

Source: Central Bureau of Statistics (BPS), 2024

Education plays a strategic role in reducing open unemployment in Aceh Province, where higher education levels are associated with lower unemployment rates, including within a gender context. University graduates have greater employment opportunities compared to secondary school graduates, who still dominate the unemployed population (BPS Aceh, 2024). This finding aligns with Psacharopoulos and Patrinos (2018), who state that education enhances productivity and employability. However, structural barriers faced by female high school and vocational school graduates indicate gender bias in the labor market (Kabeer, 2016). Studies by Tansel and Karaoglan (2021) and Balamoune-Lutz (2020) also confirm that women in developing countries are often marginalized despite their educational attainment. In Aceh, the increase in diploma and university graduates has contributed to reducing female unemployment, yet disparities persist at the secondary education level. Therefore, strengthening vocational education and implementing gender-responsive labor policies are essential to creating more inclusive employment opportunities (Bappenas, 2023; World Bank, 2022).

**Table 2.** Percentage of Population Aged 15 Years and Over in Aceh Province by Highest Educational Attainment and Gender (%)

Highest Educational Attainment						
Year	Gender	Elementary School	Junior High School	Senior High School/Vocational School	Diploma	University
2015	Male	42,1	21,3	30,4	2,1	4,0
	Female	43,9	19,8	29,1	2,2	5,0
2016	Male	41,6	21,6	30,8	2,1	4,0
	Female	43,0	20,2	29,5	2,2	5,1
2017	Male	40,9	22,0	31,1	2,1	4,0
	Female	42,4	20,6	29,8	2,2	5,0
2018	Male	40,3	22,2	31,5	2,1	4,0
	Female	41,7	21,1	30,1	2,2	5,0
2019	Male	39,8	22,5	31,7	2,1	4,0
	Female	41,2	21,3	30,3	2,2	5,0
2020	Male	35,1	25,3	28,7	2,1	8,8
	Female	34,7	24,9	28,1	2,0	10,3
2021	Male	34,2	25,9	29,4	2,2	8,3
	Female	33,8	25,6	28,9	2,1	9,6
2022	Male	33,6	25,5	30,1	2,3	8,5
	Female	32,9	25,8	30,4	2,4	8,5
2023	Male	32,9	25,8	30,4	2,4	8,5
	Female	32,4	25,3	30,1	2,3	10,1
2024	Male	28,5	20,4	32,6	4,8	13,7
	Female	30,1	18,9	31,2	6,3	13,5

Source: BPS Educational Statistics, 2015–2024

Labor force participation plays a strategic role in determining regional unemployment dynamics. A study by Apriliani et al. (2023) revealed that the rise in open unemployment rates in Aceh significantly contributes to the depth of poverty in the region. Meanwhile, Larasati (2019) highlighted the existence of gender disparities in labor force participation in Sumatra, which, in aggregate, suppress economic growth. In Aceh, the labor force participation rate remains suboptimal, influenced by population growth and low education levels that limit absorption into the formal labor market (Qaimah, 2021). This phenomenon aligns with findings from the ILO (2022) and Klasen & Pieters (2015), which emphasize that skill mismatches and gender inequality are major barriers to labor absorption in developing countries. Even among highly educated individuals, structural barriers such as mismatches between qualifications and labor market needs continue to be a primary cause of stagnant employment opportunities in Aceh.

**Table 3.** Labor Force Participation Rate (LFPR) of Males and Females, 2015–2024  
LFPR in Aceh Province

Year	Male %	Female%
2015	83,8	54,5
2016	83,4	54,3
2017	82,7	53,6
2018	82,9	53,5
2019	82,6	53,3
2020	81,47	48,94
2021	79,40	48,36
2022	81,06	46,15
2023	80,57	49,05
2024	80,68	49,62

Source: Central Bureau of Statistics (BPS), 2024

Over the past decade (2015–2024), the Labor Force Participation Rate (LFPR) in Indonesia has fluctuated in line with economic developments, digitalization, and the impacts of the pandemic. The increase in LFPR reflects the post-pandemic recovery process, although significant gender disparities remain, recorded at 65.11 percent in August 2024. The LFPR for males is still considerably higher (80.68%) than that for females (49.62%), even though female participation has grown more rapidly over the past year. This condition calls for more equitable and gender-responsive labor policies. To examine this issue, the study employs quantitative data to analyze the effects of education and labor force participation on open unemployment among males and females separately. Trends and differences are observed from open unemployment rate data by gender during the 2015–2024 period, while education and labor force participation data are analyzed to understand their contribution to gender disparities in unemployment. (Open Data Aceh, 2022).

## Research Questions

Based on the background described above, the research questions in this study are as follows:

- Does the level of education affect the gender-based open unemployment rate in Aceh Province?
- Does the labor force participation rate (LFPR) affect the gender-based open unemployment rate in Aceh Province?
- Are there differences in the effects of education level and labor force participation rate (LFPR) on the gender-based open unemployment rate in Aceh Province?

## Research Objectives

Based on the research questions above, this study aims to:

- Analyze the effect of education level on the gender-based open unemployment rate in Aceh Province.
- Analyze the effect of the labor force participation rate (LFPR) on the gender-based open unemployment rate in Aceh Province.
- Evaluate the differences in the effects of education level and labor force participation rate (LFPR) on the gender-based open unemployment rate in Aceh Province.

Previous studies have generally discussed unemployment without distinguishing gender aspects. However, the labor force participation gap between males and females remains significant, particularly in Aceh. Gender-specific analyses are still limited, especially in relation to education and LFPR. Moreover, simultaneous analytical approaches are rarely employed. Therefore, this study fills that gap by conducting a gender-based analysis using data from the 2015–2024 period.

## 2. RESEARCH METHOD

### Data and Sources of Data

This study employs a quantitative approach using the multiple linear regression method (Ordinary Least Squares/OLS) since the data are time series in nature and do not involve heterogeneous effects across cross-sectional units. Therefore, panel data models such as the Fixed Effect Model (FEM) or Random Effect Model (REM) are not utilized. Secondary data were obtained from BPS Aceh (Statistics Indonesia for Aceh Province), Open Data Aceh, and other official government publications. The independent variables consist of the education level and labor force participation rate, while the dependent variable is the open unemployment rate by gender. The analysis is conducted through multiple linear regression with gender interaction terms, and the data are processed using SPSS version 26. The validity of the data is ensured by relying exclusively on official sources.

### Data Collection Method

Data collection in this study was carried out using the documentation method, by accessing and downloading data from the official website of Badan Pusat Statistik (BPS) Aceh Province. In addition, a literature study was conducted to strengthen the theoretical foundation and support the analysis of the data obtained.

### Data Analysis Method

The data were analyzed using multiple linear regression analysis under the Ordinary Least Squares (OLS) approach. This method was chosen because it enables the simultaneous measurement of the influence of more than one independent variable on the dependent variable. The regression model is formulated as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \epsilon$$

Where:

- Y = Open Unemployment Rate (TPT)
- X<sub>1</sub> = Education Level
- X<sub>2</sub> = Labor Force Participation Rate (TPAK)
- β<sub>0</sub> = Constant

$\beta_1, \beta_2$  = Regression Coefficients

$\epsilon$  = Error Term

The analysis was performed using statistical software (e.g., SPSS, Stata, or R) to test the significance of coefficients, the R-squared value, and to examine classical assumptions such as normality, multicollinearity, and heteroskedasticity (Kusuma & Lestari, 2022).

### Significance Tests

#### t-test (Partial Test)

The t-test is used to examine the partial effect of each independent variable (X) on the dependent variable (Y) in the regression model (Kurniawan & Simanjuntak, 2022).

#### F-test (Simultaneous Test)

The F-test is employed to determine whether all independent variables in the model jointly exert a significant effect on the dependent variable (Rahmah et al., 2023).

#### Coefficient of Determination (R<sup>2</sup>)

The coefficient of determination measures how much of the variance in the dependent variable (Y) can be explained by the independent variables (X). Both R-squared and Adjusted R-squared are used to assess model accuracy (Juliprijanto & Septiani, 2019).

### Classical Assumption Tests

#### Normality Test

The normality test ensures that the residuals of the regression model are normally distributed. This is crucial to guarantee the validity of parameter estimation and hypothesis testing, as non-normal residuals may lead to inaccurate statistical inferences (Widodo & Harahap, 2023).

#### Multicollinearity Test

The multicollinearity test examines whether the independent variables (e.g., education level and labor force participation rate) are highly linearly correlated with each other. High multicollinearity can cause unstable regression estimates and make it difficult to interpret the influence of each variable (Kusuma & Lestari, 2022).

#### Heteroskedasticity Test

This test checks whether the variance of the error terms is constant across all levels of predicted values. If heteroskedasticity occurs, the estimates become inefficient, and the significance levels may be unreliable (Fauzi et al., 2023).

#### Autocorrelation Test

The autocorrelation test determines whether residuals from one period are correlated with residuals from another. The presence of autocorrelation indicates bias in the model, which is particularly problematic in time series data such as annual observations (Amalia & Yusuf, 2024).

## 3. RESULTS AND DISCUSSION

### Significance Tests

#### t-Test (Partial Test)

		Coefficients <sup>a</sup>				
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	(Constant)	68.252	67.025		1.018	.342
1	Education Level	-.604	.676	-.216	-.893	.401
	Labor Force Participation Rate	-.093	.032	-.702	-2.898	.023

a. Dependent Variable: ABS\_RES Male

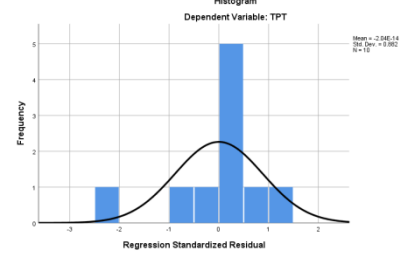
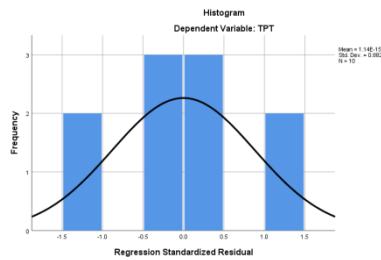
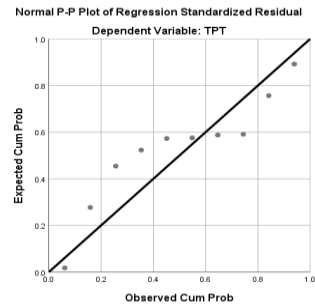
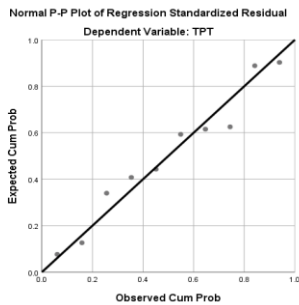
Model	Coefficients <sup>a</sup>						Collinearity Statistics	
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Tolerance	VIF	
	B	Std. Error	Beta					
1	(Constant)	435.853	282.825		1.541	.167		
	Education Level	-4.262	2.824	-.378	-1.509	.175	.990	1.010
	Labor Force Participation Rate	-.174	.063	-.688	-2.747	.029	.990	1.010

a. Dependent Variable: ABS\_RES Female

The Kolmogorov–Smirnov normality test indicates p-values of 0.200 (Male) and 0.081 (Female), both exceeding the 0.05 threshold. These results confirm that the residuals of both models are normally distributed, ensuring that the estimated coefficients and subsequent t and F tests are valid and unbiased.

**Classical Assumption Tests**

**Normality Test**



**One-Sample Kolmogorov-Smirnov Test. Male**

		Unstandardized Residual
Normal Parameters <sup>a,b</sup>	N	10
	Mean	.0000000
	Std. Deviation	.31681468
Most Extreme Differences	Absolute	.159
	Positive	.159
	Negative	-.120
Test Statistic		.159
Asymp. Sig. (2-tailed)		.200 <sup>c,d</sup>

- a. Test distribution is Normal.
- b. Calculated from data.
- c. Lilliefors Significance Correction.
- d. This is a lower bound of the true significance.

**One-Sample Kolmogorov-Smirnov Test. Female**

Unstandardized Residual

N		10
Normal Parameters <sup>a,b</sup>	Mean	.0000000
	Std. Deviation	1.02890417
Most Extreme Differences	Absolute	.248
	Positive	.197
	Negative	-.248
Test Statistic		.248
Asymp. Sig. (2-tailed)		.081 <sup>c</sup>

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

The One-Sample Kolmogorov–Smirnov Test yielded significance values of 0.200 for the Male model and 0.081 for the Female model, both greater than 0.05. Therefore, the residuals are normally distributed, implying that the regression coefficients and statistical inferences from the t and F tests are reliable without bias.

### Multicollinearity Test

#### Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.	Collinearity Statistics	
		B	Std. Error				Tolerance	VIF
1	(Constant)	44.791	181.918		.246	.813		
	TP	-.628	1.836	-.081	-.342	.742	.934	1.070
	TPAK	.295	.087	.811	3.407	.011	.934	1.070

a. Dependent Variable: TPT. Male

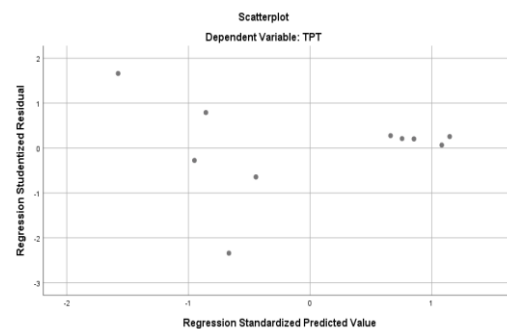
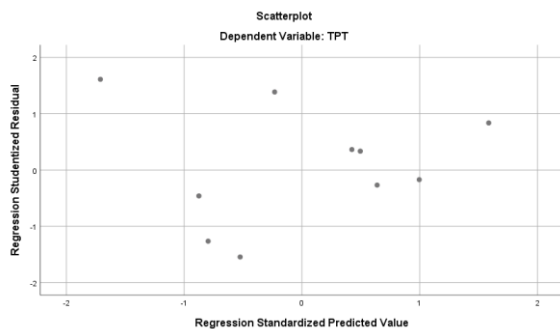
#### Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.	Collinearity Statistics	
		B	Std. Error				Tolerance	VIF
1	(Constant)	136.222	579.832		.235	.821		
	TP	-1.443	5.790	-.071	-.249	.810	.990	1.010
	TPAK	.295	.130	.649	2.277	.057	.990	1.010

a. Dependent Variable: TPT. Female

The multicollinearity test shows that all Tolerance values are above 0.10 and VIF values are below 10 for both models (Male: Tolerance = 0.934; VIF = 1.070; Female: Tolerance = 0.990; VIF = 1.010). These findings indicate that education level and labor force participation rate are not highly correlated, meaning the regression models are free from multicollinearity and the estimated coefficients are reliable for assessing the effects of both variables on gender-based unemployment in Aceh Province.

### Heteroskedasticity test



The heteroskedasticity test results show that all variables in both the Male and Female models have significance values greater than 0.05, indicating constant residual variance. Hence, the models meet the homoskedasticity assumption, ensuring that the estimated regression coefficients are efficient and unbiased. Consequently, the analysis of the influence

of education and labor force participation on gender-based unemployment can be conducted without additional data transformation.

### Autocorrelation Test

Model Summary <sup>b</sup>					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.794 <sup>a</sup>	.630	.524	.35923	1.492

a. Predictors: (Constant), TPAK, TP

b. Dependent Variable: TPT. Male

Model Summary <sup>b</sup>					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.924 <sup>a</sup>	.854	.672	.78473	1.306

a. Predictors: (Constant), TPAK, SMA\_SMK, DIPLOMA, UNIVERSITAS, SMP

b. Dependent Variable: TPT. Female

The Durbin–Watson statistics are 1.492 for the Male model and 1.306 for the Female model, both within the acceptable range of 1–3. This indicates no significant autocorrelation in the residuals, confirming that the independence of errors assumption is satisfied. Thus, the estimated effects of education level and labor force participation rate on the open unemployment rate can be interpreted without serial bias. These results are consistent with the normality, multicollinearity, and heteroskedasticity tests, all indicating that the models are free from classical assumption violations.

## 4. CONCLUSION

The results of this study indicate that the level of education has a significant negative effect on the open unemployment rate in Aceh Province, while the labor force participation rate (LFPR) has a positive effect. This means that the higher the level of education, the lower the risk of unemployment; however, when a larger proportion of the population enters the labor market without a corresponding expansion in job opportunities, the potential for open unemployment increases. Moreover, gender disparities were observed — the female LFPR is lower than that of males, yet the female unemployment rate tends to fluctuate. Therefore, the local government should expand access to vocational education and skill-based digital training while strengthening gender-responsive employment policies. Future research may include variables such as sectoral GRDP or labor market mismatch to provide a more comprehensive analysis.

## REFERENCES

- Adamy, Y., Yuliana, Y., Nur, D., Pammu, S., & Fianasari, M. O. (2024). Pengaruh tingkat partisipasi angkatan kerja (TPAK) dan jumlah penduduk terhadap pertumbuhan ekonomi Provinsi Aceh. *Inovatif: Jurnal Penelitian Ilmu Sosial*, 4(3), 19069–19080.
- Apriliansi, A. R., Safrida, S., & Fajri, F. (2023). Pengaruh Pengangguran Terhadap Indeks Kedalaman Kemiskinan Di Provinsi Aceh. *Jurnal Ilmiah Mahasiswa Pertanian*.
- Amalia, S., & Yusuf, R. (2024). *Metodologi Penelitian Sosial Kuantitatif*. Penerbit Aksara Ilmu.
- Agustina, E., Syechalad, M. N., & Hamzah, A. (2019). Pengaruh jumlah penduduk, tingkat pengangguran dan tingkat pendidikan terhadap kemiskinan di Provinsi Aceh. *Jurnal Perspektif Ekonomi Darussalam*, 4(2), 265–283.
- Bali moune-Lutz, M. (2020). *Gender inequality and employment outcomes in developing countries*. *World Development*, 130, 104937. <https://doi.org/10.1016/j.worlddev.2020.104937>
- Badan Pusat Statistik (BPS) Aceh (2024). Data Keadaan Ketenagakerjaan Aceh Agustus 2024
- Badan Pusat Statistik Provinsi Aceh. (2024). *Profil Pendidikan Penduduk Usia 15 Tahun ke Atas Provinsi Aceh Tahun 2024*.
- Badan Pusat Statistik Provinsi Aceh. (2018). *Aceh dalam Angka 2018*. Hal 146.
- Badan Pusat Statistik. (2023). *Keadaan Ketenagakerjaan Indonesia Agustus 2023*. Jakarta: BPS RI.
- Badan Pusat Statistik Provinsi Aceh. (2024). *Aceh Dalam Angka 2024*. Banda Aceh: BPS Provinsi Aceh.
- Badan Pusat Statistik Provinsi Aceh. (2019). *Aceh dalam Angka 2019*. Hal 148.
- Badan Pusat Statistik Provinsi Aceh. (2024). *Keadaan Angkatan Kerja Provinsi Aceh Agustus 2023*.

- Badan Pusat Statistik Provinsi Aceh. (2020). *Aceh dalam Angka 2020*. Hal 147.
- Badan Pusat Statistik Provinsi Aceh. (2021). *Aceh dalam Angka 2021*. Hal 144.
- Badan Pusat Statistik Provinsi Aceh. (2016). *Aceh dalam Angka 2016*. Banda Aceh: BPS Provinsi Aceh. Hal 160.
- Badan Pusat Statistik Provinsi Aceh. (2017). *Aceh dalam Angka 2017*. Hal 164.
- Badan Pusat Statistik Provinsi Aceh. (2018). *Aceh dalam Angka 2018*. Hal 166.
- Badan Pusat Statistik Provinsi Aceh. (2024). Keadaan Ketenagakerjaan Aceh Februari 2024
- Badan Pusat Statistik. (2021). *Statistik Pendidikan 2020*. Jakarta: BPS RI.
- Badan Pusat Statistik. (2022). *Statistik Pendidikan 2021*. Jakarta: BPS RI.
- Badan Pusat Statistik. (2023). *Statistik Pendidikan 2022*. Jakarta: BPS RI.
- Badan Pusat Statistik. (2024). *Statistik Pendidikan 2023*. Jakarta: BPS RI.
- Cut Dinul Qaimah (2021) Analisis Faktor-Faktor Yang Mempengaruhi Tingkat Partisipasi Angkatan Kerja Di Provinsi Aceh. Universitas Islam Negeri Ar-Raniry Banda Aceh
- Damayanti, A. H., & Sirodj, D. A. N. (2022). *Pemodelan Geographically Weighted Regression dengan Fungsi Pembobot Fixed Gaussian Kernel untuk Kasus TPAK Wanita di Provinsi Aceh*. Bandung Conference Series: Statistics
- Deepa, K., & Jayaram, A. (2020). Gap between Education and Employment: A Micro Study in Vellakinar Village.
- Fauzi, M., Hasanah, S., & Nurdin, M. (2023). Analisis Faktor-Faktor yang Mempengaruhi Pengangguran di Indonesia. *Jurnal Ekonomi Pembangunan Indonesia*, 11(2), 89–102.
- Klasen, S., & Pieters, J. (2015). *What explains the stagnation of female labor force participation in urban India?* World Bank Economic Review, 29(3), 449–478. <https://doi.org/10.1093/wber/lhv003>
- Kabeer, N. (2016). *Gender, labour markets and poverty: An overview*. *Development Policy Review*, 34(2), 171–183. <https://doi.org/10.1111/dpr.12174>
- Kementerian PPN/Bappenas. (2023). *RPJMN 2020–2024: Penurunan Pengangguran dan Peningkatan SDM*.
- Kusuma, D., & Lestari, I. (2022). *Analisis Regresi dengan SPSS untuk Penelitian Sosial-Ekonomi*. Jakarta: Prenada Media.
- Kurniawan, H., & Simanjuntak, F. (2022). *Analisis Statistik Ekonometrika Terapan*. Jakarta: Prenada Media.
- International Labour Organization (ILO). (2022). *World Employment and Social Outlook: Trends 2022*. Geneva: ILO. <https://www.ilo.org/global/research/global-reports/weso>
- Larasati, M. G. D. (2019). Analisis Pengaruh Indikator Ketimpangan Gender terhadap Pertumbuhan Ekonomi di Pulau Sumatera.
- Mankiw, N. G. (2021). *Prinsip-prinsip ekonomi* (edisi ke-7). Cengage Learning.
- Mufida, L. L. N., & Nasir, M. (2023). Analisis dinamis tingkat pengangguran di Indonesia. *Journal of Macroeconomics and Social Development*, 11(2), 89–102.
- Matiuk, T., & Bessarabova, N. (2020). Correlation between level of education and employment rate. *Economics. Finances. Law*.
- Open Data Aceh. (2022). Persentase Tingkat Pengangguran Terbuka (TPT) Menurut Jenis Kelamin.
- Open Data Aceh. (2024). *Jumlah Penduduk Berdasarkan Pendidikan dan Jenis Kelamin Menurut Kabupaten/Kota di Aceh 2023–2024*.
- Psacharopoulos, G., & Patrinos, H. A. (2018). *Returns to investment in education: A further update*. *Education Economics*, 26(5), 445–458. <https://doi.org/10.1080/09645292.2018.1484426>
- Putri, I. C., Juliprijanto, W., & Septiani, Y. (2019). Analisis Pengaruh Tingkat Pendidikan, Pengangguran dan PDRB Terhadap Kemiskinan Di Karesidenan Kedu Tahun 2014-2017. *DINAMIC: Directory Journal of Economic*, 1, 338–347.
- Rahman, M. F., Yusuf, A. A., & Suryani, D. (2022). *Education, labor participation, and unemployment dynamics in Indonesia: Regional perspectives and policy implications*. *Journal of Asian Economics*, 82, 101510. <https://doi.org/10.1016/j.asieco.2022.101510>
- Rahmah, S., Yusriadi, & Hartati, R. (2023). Signifikansi Variabel Ekonomi terhadap Tingkat Pengangguran Terbuka. *Jurnal Ekonomi dan Kebijakan Publik*, 14(1), 89–102.
- Sztyber, W. (2020). Impact of education on employment. *Polityka Spoleczna*.
- Sumantri, I. H. (2025). *Pengaruh Pertumbuhan Ekonomi, Kemiskinan, RLS dan Tingkat Pengangguran Terhadap Ketimpangan Pendapatan Daerah Provinsi Aceh*. UIN Jakarta.

- Sholihah, N. N. S., et al. (2024). Faktor-faktor yang Mempengaruhi Tingkat Partisipasi Angkatan Kerja Aktif di Indonesia. *SABANA: Jurnal Sosiologi, Antropologi, dan Budaya Nusantara*
- Tansel, A., & Karaoglan, D. (2021). *Gender differences in labor market outcomes in developing countries. IZA Journal of Labor Policy*, 11(1), 1–23. <https://doi.org/10.1186/s40173-021-00135-2>
- World Bank. (2022). *World Development Report 2022: Gender equality and jobs in the global economy*. Washington, DC: World Bank. <https://doi.org/10.1596/978-1-4648-1810-4>
- Widodo, T., & Harahap, D. (2023). Uji Asumsi Klasik pada Analisis Regresi: Teori dan Aplikasi. *Jurnal Statistika Terapan Indonesia*, 8(1), 1–15
- Yusuf, M. (2022). *Pengembangan Media E-Ide untuk Kompetensi Menentukan Pokok Pikiran Siswa Kelas V SD*. Joyful Learning Journal.
- Zahara, R. (2019). Faktor-Faktor Yang Mempengaruhi Pengangguran Terbuka Di Provinsi Aceh (Disertasi Doktor, UIN AR-RANIRY).