

Analysis of the Influence of Demography and Education on Youth Unemployment in Indonesia

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ABSTRACT

This study analyses the influence of demography and education on youth unemployment in Indonesia. The demographic conditions are examined based on the youth population, adult unemployment, and sex ratio. Education is measured by the percentage of the labour force that has completed at least high school education. The model used is panel data regression analysis, employing time series data from 2013–2022 and cross-section data from 34 provinces in Indonesia. The study found that demographic conditions significantly influence youth unemployment levels in Indonesia. The increase in the number of young people needs to be managed so that their entry into the labour force is more manageable, by increasing the promotion of education and expanding skills training for young people. Adult unemployment is a competitor to the youth labour force, reducing the opportunity for young people to find employment, and the results of this study highlight that the distribution of women entering the labour force is smaller, so an increase in the number of men entering the labour force has a positive effect on the increase in youth unemployment. Meanwhile, increasing the proportion of the labour force with at least a high school education can reduce youth unemployment in Indonesia.

Keywords: Youth Unemployment, Demography, Education.

JEL Classification: C23, E24, J01, J16

INTRODUCTION

Unemployment is an important concern because at a macro level, the impact of high unemployment can reduce the level of the country's economy in aggregate, which leads to political instability, decreases the level of investor confidence, and affects individual social and mental health (Franita & Fuady, 2019). In terms of socioeconomics, unemployment can increase the amount of poverty, because the population does not have jobs and income, which encourages the number of beggars, vagrants, and buskers, which leads to an increase in crime rates such as stealing, robbing, and others as a demand to fulfil their lives. This condition is more vulnerable to the young labour force, as the difficulty of finding work for the young labour force can lead to psychological problems, social problems and a tendency to engage in collective crime (Baah-Boateng, 2016)

The indicator used to measure the size of the labour force that becomes unemployed can be seen through the open unemployment rate (TPT). The open unemployment rate shows the amount of labour supply that is not used or absorbed by the labour market. The condition of unemployment must be identified carefully and precisely, so the International Labour Organisation (ILO) classifies the workforce based on age, namely young people are teenagers (15-19) and young adults (20-24) (Bayrak & Tatli, 2018; Saepudin & Nurfala, 2022). Meanwhile, the Organisation for Economic Co-operation and Development accepts a young population aged 15-24 years. Thus, the indicator of young age according to Statistics Indonesia includes people aged between 15-24 years, while "adults" are defined as those aged 25 years and above.

In 2022 the problem of youth unemployment was felt by every provincial region in Indonesia, the publication results of the Central Bureau of Statistics (BPS) showed that the unemployment rate that occurred in every province in Indonesia was dominated by the youth labour force. Overall, the youth unemployment rate in Indonesia is 6 times higher than the adult unemployment rate.

Table 1. Unemployment Rate by Province in Indonesia, 2022

No	Province	Unemployment rate		
		Usia 15-24	Usia > 25	All Age Groups
1	Aceh	21,63	3,58	6,17
2	Sumatera Utara	19,33	3,22	6,16
3	Sumatera Barat	19,31	4,01	6,28
4	Riau	17,52	1,93	4,37
5	Jambi	17,68	2,37	4,59
6	Sumatera Selatan	18,87	2,05	4,63
7	Bengkulu	12,60	2,28	3,59
8	Lampung	14,88	2,69	4,52
9	Kepulauan Bangka Belitung	12,51	3,34	4,77
10	Kepulauan Riau	23,20	4,82	8,23
11	DKI Jakarta	27,57	3,75	7,18
12	Jawa Barat	30,02	4,06	8,31
13	Jawa Tengah	17,06	3,68	5,57

No	Province	Unemployment rate		
		Usia 15-24	Usia > 25	All Age Groups
14	D.I. Yogyakarta	14,60	2,71	4,06
15	Jawa Timur	20,14	3,42	5,49
16	Banten	28,60	4,17	8,09
17	Bali	11,52	3,70	4,80
18	Nusa Tenggara Barat	9,42	1,82	2,89
19	Nusa Tenggara Timur	11,17	2,15	3,54
20	Kalimantan Barat	17,95	2,64	5,11
21	Kalimantan Tengah	16,47	2,34	4,26
22	Kalimantan Selatan	16,43	2,77	4,74
23	Kalimantan Timur	19,04	3,25	5,71
24	Kalimantan Utara	13,63	2,76	4,33
25	Sulawesi Utara	28,83	3,50	6,61
26	Sulawesi Tengah	11,60	1,61	3,00
27	Sulawesi Selatan	16,47	2,53	4,51
28	Sulawesi Tenggara	10,18	2,02	3,36
29	Gorontalo	21,06	1,09	4,10
30	Sulawesi Barat	6,47	1,51	2,34
31	Maluku	26,21	3,62	6,88
32	Maluku Utara	16,39	2,12	3,98
33	Papua Barat	16,22	3,47	5,37
34	Papua	9,05	1,52	2,83
	Indonesia	20,67	3,29	5,87

Source: BPS, Indonesian Labour Force Statistics, 2022

It can be seen that the young population under the age of 25 is a population group that should receive attention, because at this age the transition from school to the integration of young people in the labour market is one of the most critical and urgent problems of labour market functioning, with significant econometric and social impacts. It is also worth mentioning that sometimes young people start their activity in neglected areas, inferior in qualifications and at other times young people penetrate unproductive labour circuits, the socio-cultural fact is that society considers young people to have no experience and lack skills (Condratov, 2014; Jubaedah & Amelia, 2021; Kurniawan et al., 2021)

Theoretical studies related to unemployment have been outlined from the classical economic era, Malthus' theory which suggests that population growth is in a measuring series and food production grows in a counting series, then according to Robert Solow in classical economic theory explains that economic growth is a series of activities originating from capital accumulation, population growth, the use of technology and an increase in production output. The role of the population in driving economic growth is as a human resource that can be seen through its activities as a labour force, so that population growth can have a positive or negative impact on economic development in a region (Djulus et al., 2022; Nurhayati et al., 2023; M. E. Putra, 2018; Rostiana et al., 2022; Safitri et al., 2023).

Undoubtedly, the young population is one of the most important resources for the socio-economic development of a nation. This category of population has the courage and energy to propose innovative ideas and progressive mechanisms in all socio-economic fields. However, every year the population entering working age will continue to grow, this condition can have a positive impact on regional development. As the theory put forward by Robert Solow that population growth will contribute as human resources that become labour. Meanwhile, if the increase in the population entering working age is not matched by the availability of adequate new jobs, it will lead to unemployment for the young population (M. E. Putra, 2018).

Demographic conditions participate in determining the unemployment rate in Indonesia, the percentage of male youth now exceeds the percentage of female youth aged 15 years and above, with 50.55% male and 49.45% female. The gap between men and women in entering the labour force is more evident in the number of youth entering the labour force, where 61.06% are dominated by men and 38.94% are women. This condition shows that women enter the labour force less than men (BPS, 2023).

The increasing number of unemployed adults is also a challenge for the young workforce in Indonesia, throughout 2013-2022 the number of unemployed adults in Indonesia fluctuated but tended to increase. Central Statistics data shows that in 2013 the number of unemployed adults in Indonesia reached 3,122,151 people, experienced a significant increase in 2020 of 5,427,443 people and decreased again until in 2022 it reached 4,029,518 people. The increase in the number of unemployed adults can be a competitor for the young workforce in the labour market (BPS, 2023).

The high youth unemployment rate indicates that youth competitiveness is still below the ideal level. One factor that contributes to the high youth unemployment rate is the lack of youth competition in the labour market. This happens because many businesses prefer to hire employees who already have experience and have higher education. In 2022, 59.95% of the youth labour force had a high school education and 7.40% were college graduates. However, there was still a youth labour force that had never been to school and had not graduated from primary school, reaching 638,319 people or 3% and a labour force with primary and junior high school education reaching 29.66% of the total youth labour force (BPS, 2023).

This research is focused on analysing the factors that influence youth unemployment, this research refers to the results of research conducted by (Baah-Boateng, 2016) that demographic characteristics and education are an important part of influencing youth unemployment in terms of labour supply. Another variable is to complement the results of previous research by including the adult unemployment rate in demographic characteristics (Bal-Domańska, 2022). In order to obtain more comprehensive research results, this study uses panel data

with a time period of 10 years, namely from 2013-2022 in 34 provinces in Indonesia. Based on the background and literature review that has been described, the factors that influence youth unemployment in Indonesia can be seen from demographic indicators such as the number of youth people, the number of unemployed adults, the ratio of men and women, and the level of education of the labour force.

METHOD

The purpose of this study is to analyse the effect of demography and education on youth unemployment in Indonesia. Previous research related to the level of youth unemployment has been conducted by (Baah-Boateng, 2016) that demographic characteristics are an important part of influencing youth unemployment, through panel data regression analysis of 41 countries in Africa from 2000-2010 shows that an increase in the number of youth and sex ratio also increases youth unemployment, this is due to the limited number of young people who can continue their education and have low skills, while education is able to reduce the level of youth unemployment. The condition of youth unemployment is explained by (Bal-Domańska, 2022) in her research in 28 EU countries in 2008-2018 that the presence of adult unemployment is a competitor for the new labour force, thus increasing the youth unemployment rate. (Choudhry et al., 2013) highlighted the impact that causes youth unemployment using panel data analysis of OECD countries from 1980-2009 that the number of youth needs to be controlled so that more continue their education and take part in training, because the level of education can reduce the number of unemployed youth, Thus, the variables that contribute to the condition of youth unemployment can be seen from demographic and educational conditions, namely the variable number of youth, adult unemployment, sex ratio, and the level of labour force education. The data collected in this research is secondary data. The data is generally sourced from the Central Bureau of Statistics (BPS). The data used is panel data, which is data consisting of two parts including time series data and cross section data (Manik et al., 2023; Setiawan et al., 2021). The time series data used is annual data from 34 provinces in Indonesia for 10 years, namely from 2013-2022.

Table 2. Variable Operationalization Description

Variables	Role	Definition	Unit	Source
Youth Unemployment Rate (YUR)	Dependent Variable	Unemployment rate for 15-24 year old	Percent	BPS
Youth Population (YP)	Independent Variable	Ratio of youth (population aged 15-24 years) to total adult population (population aged >25 years)	Percent	BPS

Variables	Role	Definition	Unit	Source
Adult Unemployment (AUN)	Independent Variable	Unemployment rate 25 years old and above	Percent	BPS
Sex Ratio (FEM)	Independent Variable	Male-female ratio of the youth labor force	Percent	BPS
Education (EDU)	Independent Variable	Percentage of the labor force that has at least a high school education	Percent	BPS

The model specification is based on research conducted by (Baah-Boateng, 2016), (Gustina Sari, 2020), (Bal-Domańska, 2022) and (Choudhry et al., 2013) that youth unemployment can be viewed from demographic conditions, namely the number of youth, the sex ratio of the young workforce, the adult unemployment rate and education. so that the model specification used in this study is as follows:

$$YUR_{it} = \alpha_0 + \beta_1 YP_{it} + \beta_2 AUN_{it} + \beta_3 FEM_{it} + \beta_4 EDU_{it} + \varepsilon_{it} \dots \dots \dots (1)$$

Where:

- YUR = Youth Unemployment Rate
- YP = Youth Population
- AUN = Adult Unemployment
- FEM = Sex Ratio
- EDU = Education
- β = Koefisien Estimator
- i = Cross Section 34 Province in Indonesia
- t = Time Series 2013-2022
- ε = Error Term

RESULT

The results of the panel data regression analysis conducted in this study are to determine the effect of demographics and education on the level of youth unemployment in Indonesia. The model used in this study refers to previous studies such as those conducted by (Baah-Boateng, 2016), (Bal-Domańska, 2022), (Gustina Sari, 2020), (Choudhry et al., 2013). Panel data analysis can be done when it has gone through three approaches to get the best model, the three approaches taken are Common Effect, Fixed Effect and Random Effect. Determination of the model needs to be done through several stages of testing, namely the chow test and the hausman test. Furthermore, to produce the right conclusion, the data used must fulfil classical assumptions by performing multicollinearity and heteroscedasticity.

Model selection is carried out by means of several stages of testing, namely the chow test to choose between the Fixed Effect Model and the Command Effect Model and the Hausman test to choose between the Fixed Effect Model and the Random Effect Model.

The approach to choosing the best model between the fixed effect model and the command effect model is done through the chow test. The criteria for the chow test are if the chi-square probability value is below the critical value of 5% or 0.05 then the best model used is the fixed effect model. But if on the contrary the best model used is the command effect model.

Table 3. Hasil Uji Chow

Effect Test	Statistic	d.f	Prob.
Cross-section F	20.074032	(33.302)	0.0000
Cross-section Chi-square	394.782089	33	0.0000

Source: Data Processing Results, Year 2023

Based on the chow test output in this study, the chi-square probability value is 0.0000, this figure is smaller than the critical value of 0.05. Thus, through the chow test that the best model used in the study is to use the fixed effect model approach.

The next step to determine the best model between the fixed effect model and the random effect model is done through the Hausman test. The criteria for the hausman test results are if the probability value is below the critical limit of 5% or 0.05, the best model used is the fixed effect model. But if on the contrary, the best model used is the random effect model.

Table 4. Hausman Test Result

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f	Prob.
Cross-section random	69.532788	4	0.0000

Source: Data Processing Results, Year 2023

Based on the output of the hausman test results conducted in this study, it shows a probability value of 0.0000, which is smaller than the critical limit value of 0.05. Then the best model that can be used through the hausman test is the fixed effect model.

Multicollinearity test is used to detect whether the estimation results are likely to produce biased estimators or produce incorrect conclusions (D. N. I. Gujarati & Dawn, n.d.). The criteria used in the multicollinearity test is if the correlation value between independent variables is greater than 0.9 then there are symptoms of multicollinearity, but conversely if the value is smaller than 0.9 then there are no symptoms of multicollinearity (Imam Gozali & Dwi Ratmono, 2017).

Table 5. Multicollinearity Test Results

	AUN	EDU	YP	FEM
AUN	1			
EDU	0,5448	1		
YP	-0.0989	-0.2664	1	
FEM	-0.3001	-0.3611	0.3836	1

Source: Data Processing Results, Year 2023

Based on the output of the multicollinearity test results in this study, it shows a value smaller than 0.9, so it can be concluded that in this study there is no multicollinearity problem.

Heteroscedasticity is a condition where there are differences in the variance of the residuals. Heteroscedasticity testing needs to be done so that the resulting research becomes efficient, because if the estimation results have heteroscedasticity problems, even though they are unbiased, the results will be inefficient or misleading (Imam Gozali & Dwi Ratmono, 2017). The criterion used in the Glejser test is to compare the chi-square probability value with its critical value of 5% or 0.005, if the value is greater then there are no symptoms of heteroscedasticity.

Table 6. Glejser Test Results

Heteroskedasticity Test: Glejser			
F-statistic	1,625448	Prob. F(4,331)	0,1674
Obs*R-squared	6,473198	Prob. Chi-Square(4)	0,1665
Scaled explained SS	6,374572	Prob. Chi-Square(4)	0,1729

Source: Data Processing Results, Year 2023

The results of the Glejser test above show that the chi-square probability is 0.1665 or greater than 0.05 so that in this study there is no heteroscedasticity problem.

Based on the results of the model selection test that the regression analysis used uses a fixed effect model. Likewise, the results of the classical assumption test that the data used meets the classical assumptions, so it can be concluded that the data used meets the BLUE (best linear unbiased estimator) criteria, so the output or conclusions of the resulting research are unbiased, efficient, consistent and valid. The panel data regression test results are as in the following table.

Table 7. Panel Data Regression Test Results

Variables	Coefficient	Prob	Significance
C	2.073814	0.0000	
YP	0.010356	0.0034	*Significance
AUN	0.067752	0.0000	*Significance
FEM	0.002508	0.0002	*Significance
EDU	-0.004557	0.0621	*Not Significant
Uji F Statistik		40.98876	
Prob. F-Statistik		0.000000	
R-Square		0.833937	
*significance level 5%			

Source: Data Processing Results, Year 2023

Partial significance test is conducted to see the influence of each independent variable on the dependent variable. Based on the output of the partial test results (t test), it explains that at the 5% significance level, there are 3 variables in this study that have a significant influence, namely the number of youth, adult unemployment, and sex ratio, while the education variable does not have a

significant influence on the level of open unemployment at a young age in Indonesia.

After conducting a partial significance test to identify the influence of each independent variable on the dependent variable, then a simultaneous significance test is conducted to identify whether together all independent variables have a significant influence on youth unemployment in Indonesia. The output of the simultaneous significance test results (f test) has an F-statistic value of 40,98876 and the F-stastic probability value of 0.0000 which is smaller than the significance level or critical limit of 0.05, so it can be concluded that at the 5% significance level all research variables simultaneously have a significant influence on the level of open youth unemployment in Indonesia.

Next, to find out how much the independent variables affect the dependent variable in this study, the coefficient of determination test is conducted. Based on the results of the coefficient of determination test, it can be seen from the R-squared value, which shows a value of 0.833937, which means that the independent variables used in this study are able to explain their influence on the dependent variable (the level of youth unemployment in Indonesia) by 83.39 per cent, while the other 16.61 per cent is explained by other variables outside the model.

DISCUSSION

This study aims to analyze the factors that influence youth unemployment in Indonesia. Youth unemployment is an important concern because during the last 10 years it has a fairly large number when compared to the unemployment rate in adults. Based on the results of empirical studies, unemployment that occurs in young people can be viewed from the supply side in the labor market, namely the demographic conditions and education of the workforce involved in the labor market. In this study, the factors influencing youth unemployment are viewed from demographic conditions, which include variables of the number of youth people, adult unemployment and sex ratio, while education is seen from the percentage of the number of workforces who have completed at least high school education.

The estimation results through panel data regression using the fixed effect model show that there is a positive and significant influence between the number of youth and the youth unemployment rate in Indonesia. In accordance with the hypothesis and previous research. According to (Baah-Boateng, 2016) that an increase in the number of youth increases the youth unemployment rate due to lack of attention to the management of the number of youth. The number of youth in this study is shown by the ratio value to the total adult population. The number of youth has a positive relationship and has a significant influence on the youth unemployment rate in Indonesia. The coefficient of the number of youth

has a value of 0.010356 which means that if there is an increase in the number of youth by 1%, it can cause an increase in the level of youth unemployment in Indonesia by 0.010356 per cent (*ceteris paribus*).

The number of youth in Indonesia has increased every year, this condition can increase unemployment if it is not accompanied by the absorption of employment, as previously stated by Robert Solow that the growth of the labor force will be reflected as a human resource that becomes a productive workforce, but if the increase in the population entering working age is not matched by the availability of adequate employment opportunities, it will lead to greater unemployment in the young population (M. E. Putra, 2018). There have been many literature studies related to the number of youth population to the youth unemployment rate. The results of research (Choudhry et al., 2013), (Bayrak & Tatli, 2018), and (Rahman et al., 2021) show that an increase in the number of youth can lead to an increase in the youth unemployment rate.

The estimation results show that adult unemployment has a significant influence and has a positive relationship with the level of youth unemployment. In accordance with the hypothesis and previous studies, according to (Bal-Domańska, 2022) the presence of adult unemployment creates competition for youth unemployment, so that the increase in adult unemployment can reduce the opportunity for youth to get a job. The result of panel data regression test using fixed effect model in this study obtained a coefficient value of 0.067752, therefore, every 1% increase in the number of adult unemployment can increase the youth unemployment rate by 0.067752 per cent (*ceteris paribus*).

Unemployment in adulthood occurs due to changes in labor market conditions, as explained by (Mankiw, 2016) when a company goes bankrupt, there is an update to the technology used, it can cause workers who are unable to develop to lose their jobs, this condition can cause unemployment which tends to be felt by the adult workforce. The presence of adult unemployment is a challenge for the young labor force, because some companies that need labor prefer experienced workers, so young people are locked in an experience trap through limited employment opportunities (Choudhry et al., 2013). The effect of the adult unemployment rate on the youth unemployment rate is clearly visible through statistical data in 2022 which shows that there is a large enough absorption of labor for the adult unemployed so as to reduce unemployment by 1,005,395 people, which results in an increase in unemployment for the young labor force. The positive relationship between adult unemployment and youth unemployment has also been explained by Beata (Bal-Domańska, 2022) through her research results that the presence of adult unemployment creates competition for youth unemployment, so that the increase in adult unemployment can reduce the opportunity for youth to get a job and increase unemployment.

The estimation results in this study show that the sex ratio has a significant effect and has a positive relationship with the youth unemployment rate. In accordance

with the hypothesis and previous research, (Baah-Boateng, 2016) explains that the unequal distribution of genders to enter the labor market may underscore the difficulties faced by young women to enter the labor force. The regression test output shows a coefficient value of 0.002508, which means that a 1% increase in the percentage of men to women can increase the youth unemployment rate in Indonesia by 0.002508 index units (*ceteris paribus*).

The sex ratio provides information on the ratio between the number of female labor force and the number of male labor force at a young age. Indonesian labor force statistics show that the male labor force is always more than the female labor force, the positive relationship from the results of this study explains when a higher sex ratio can increase the youth unemployment rate, meaning that the increase in the male labor force should be an important concern because it can increase the youth unemployment rate in Indonesia. In 2022 the number of unemployed youth is more men than women, this is because women are more distributed into the non-labor force, namely mostly taking care of households and schools, this condition shows that there is an unevenness for the young workforce to enter the labor market, according to Hettige et. al. in research (Weerasiri & Samaraweera, 2021) the still occurrence of discriminatory practices related to market access encourages women not to enter the workforce and become housewives. The results of this study are in line with the results of research conducted by (Abshoko, 2016) that the sex ratio which shows more men than women has a positive relationship with the unemployment rate.

The estimation result through panel data regression using fixed effect model shows that there is an insignificant effect between education and youth unemployment rate in Indonesia. This study shows similar results to the observation made by (Baah-Boateng, 2016) that found no significant effect of education on youth unemployment. The level of education in this study is indicated by the percentage of the labor force that has at least a high school education. Meanwhile, the output of the regression result shows a coefficient value of -0.004557, which means that the level of education has a negative relationship with the level of youth unemployment, meaning that when there is an increase in the labor force that completes at least a high school education by 1%, it can reduce the unemployment rate by -0.004557 per cent (*ceteris paribus*).

The development of the percentage of the labor force that completed at least high school / equivalent level of education shows an increasing number from 2013-2022. The increasing level of education for Indonesia's young workforce indicates better development of labor force resources, according to (Baah-Boateng, 2016) if the quality of education increases, it will make them work profitably and productively, so that those with better education with more professional experience in the world of work are more likely to be successful in finding a job. This is also in accordance with research conducted by (Bayrak & Tatli, 2018), (Choudhry et al., 2013), (G. A. Putra & Siti Aisyah, 2021) showing that

every additional number of youth who have education can reduce the unemployment rate, because education can improve the quality of resources so that they are more efficient and effective in obtaining employment. In addition, according to (Gustina Sari, 2020) which also supports the results of this study, it explains that someone who has a higher level of education will be more efficient in finding a new job and getting a higher wage.

CONCLUSION

This study aims to analyze the factors that influence youth unemployment in Indonesia. The results of this study produce several findings including Demographic conditions have a significant influence on the level of youth unemployment in Indonesia. The number of youth that continues to increase every year cannot be absorbed optimally so that it has a unidirectional relationship, so it is necessary to manage the number of youth through the promotion of education and the expansion of skills training for young people, so that the increasing number of youth entering the workforce is ready to compete in the labor market. The presence of the adult workforce becomes a competitor to the young workforce, so that the increase in the adult workforce can reduce the opportunity for youth to get a job, thus, adult unemployment needs to be suppressed by providing training and skills to the adult workforce who are already working in order to be able to balance the needs of the workforce. The sex ratio shows that the young workforce is dominated by the male workforce, this condition can illustrate that there is still an unequal distribution between men and women entering the workforce, women are mostly included in the non-labour force, namely housewives, thus, the government must expand access for women to enter the workforce, by providing facilities for women such as awareness programs for cultural and religious barriers, proper childcare facilities for young mothers, and employment opportunities for women. While education is seen as an indicator that can explain the resources possessed by individuals, it has a negative relationship with the youth unemployment rate in Indonesia. An increase in the percentage of the labour force that graduates at least at the senior high school level can reduce the youth unemployment rate in Indonesia.

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