



UDC 349; DOI 10.18551/rjoas.2022-07.04

TESTING OKUN'S LAW ON YOUTH AND ADULT UNEMPLOYMENT

Susanto Joko*, **Udjianto Didit Welly**, **Windyastuti**

Faculty of Economics and Business, FEB UPN "Veteran" Yogyakarta, Indonesia

*Email: jk.susanto.68@gmail.com

ABSTRACT

Characteristics of unemployment vary, so this study analyzes whether the effect of growth on unemployment differs between youth and adults. This study uses secondary data covering the growth, unemployment, and wages of several age groups. The research period lasts from 1991 to 2021. This study uses regression analysis based on Okun's Law. The regression model is realized in the equation with an unemployment rate as the dependent variable, growth as the independent variable, and wages as a covariate. The results show that growth has no impact on youth unemployment. However, growth has a negative effect on adult unemployment. Higher growth leads to lower adult unemployment. That is, for adult unemployed, the result is in line with Okun's law. However, the results do not support Okun's law for youth unemployment. Furthermore, the wage rate negatively affects youth unemployment, but the wage rate does not affect adult unemployment. Furthermore, the change in government from the New Order to the Reform Order impacts youth and adult unemployment.

KEY WORDS

Growth, unemployment, youth, adult.

One of the targets of economic development is reducing the unemployment rate. Unemployment is a problem that always occurs in almost all countries, including Indonesia. A large workforce, accompanied by the disconnection between domestic agricultural development and industrialization, causes Indonesia faces a labor surplus problem (Habibi & Juliawan, 2018). The number of job seekers is much greater than the number of vacancies, so several job seekers do not get the job they want. They are forced to become unemployed and do not have any income. Basically, income can come from work or the utilization of assets. However, generally, the assets owned by workers are limited. Due to the limited asset, the primary income for workers comes from wages. Without wages, they cannot fulfill their need and tend to become poor. Recently, unemployed workers get unemployment benefits through Job Loss Guarantee Program, but the limited money received is insufficient to fulfill their needs. Besides, this program also has a limited duration. Unemployment benefit, in terms of both benefit magnitude and duration, is lower in emerging than in advanced countries (Asenjo & Pignatti, 2019), so workers cannot rely on the money they receive from the job loss insurance. Workers must keep themselves from being unemployed to get paid for fulfilling their needs.

Unemployment shows that some workers are not involved in the production process, so the output produced is lower than it should be. This means that unemployment causes growth not to reach its optimal point. Lower growth indicates a less added value that can be created in the production process. A lower added value indicates low purchasing power and negatively impacts basic needs such as education and health. High unemployment hinders economic development goals. Unemployment inhibits government programs to improve welfare (Wahyuningrum & Soesilowati, 2021). Welfare is one indicator of government performance. Low welfare causes dissatisfaction with the government's performance and encourages people to protest against the government. Then, this dissatisfaction shifted the people's choice to other parties when the next general election was held. Unemployment is a major economic problem because of its negative effects on people's welfare, such as drug addiction (Anbaraki & Ismaili, 2021; Nagelhout et al., 2017) and crime (Gao et al., 2017). Unemployed often commit criminal acts to earn money. The high crime rate causes public



disappointment with the government's performance. Therefore, the government always tries to reduce unemployment (Cristescu, 2017). One of the efforts made is to encourage economic growth.

Economic growth requires more labor to realize an increase in output (Knotek, 2007), so the unemployment rate goes down. There is a negative linkage between economic growth and Unemployment (Hjazeen et al., 2021). The higher growth leads to lower unemployment (Tesfaselassie & Wolters, 2018). The relationship between output and unemployment is exhibited by Okun Law. The Okun law is based on regression analysis of U.S. data that shows a relationship between Unemployment and GDP. Okun's law describes a negative relationship between unemployment and economic growth. The high growth makes the unemployment rates go down. Therefore, the government needs to focus on high economic growth to create more vacancies so that unemployment goes down (Hashmi et al., 2021).

However, economic growth is not always accompanied by a decreased unemployment rate. Some researchers support Okun's Law that an increase in output leads to a decrease in unemployment (Ball et al., 2019; Bođa & Považanová, 2021; Louail & Hamida, 2021; Yahia, 2018). Although their research shows different Okun coefficients, they state that higher growth is accompanied by lower unemployment. Yahia (2018) investigated the existence of Okun's relationship in Algeria by utilizing the Autoregressive Distributed Lag (ARDL) linear model and the Bayesian Normal Linear Regression model. The results show that Okun's law applies in that country. In addition, Louail & Hamida (2021) predict Okun's law for the Arab economy. The results of this study indicate that the Okun coefficient applies to Arab countries, so these countries seek to encourage economic growth to overcome unemployment. Furthermore, Ball et al. (2021) compare the performance of Okun's Law in developed and developing countries. The average magnitude of the Okun coefficient in developing countries is about half of the Okun coefficient in developed countries. Bod'a & Povanoza (2021) looked at Okun's laws for 21 OECD countries. For most OECD countries, Okun's law asserts itself to a greater extent when output is receding than in years when it is growing. Okun's law is more robust in almost all countries where unemployment is decreasing than in countries where unemployment is increasing. Thus, the decline in unemployment accompanies growth, so growth is a reliable instrument to reduce unemployment. The government can rely on growth as an instrument to reduce unemployment.

Conversely, some other research did not support the Okun Law. They exhibited that the growth did not accompany by a significant decrease in unemployment (Bankole & Fatai, 2013; Lal et al., 2014; Valadkhani & Smyth, 2015). Lal et al. (2014) checked the validity of Okun's law in some countries in the Asian region. They utilized the Engle-Granger cointegration technique to find a long-run relationship between variable and error correction mechanisms. The result showed that Okun's law is not applied in some Asian developing countries. Bankole & Fatai (2013) estimated Okun's coefficient and checked the validity of Okun's law in Nigeria by Engle-Granger cointegration test and Fully Modified OLS. The empirical evidence exhibited a positive coefficient in the regression, implying that Okun's law does not apply to Nigeria. Moreover, Valadhani & Smyth (2015) examined whether Okun's law has been stable in the United States (US). They employed a Markov Switching model, which allows for possible asymmetries within and across regimes and for the variance in the error term to switch over time. The result showed a weakening of Okun's law since the 1981-1982 recession. Therefore, the unemployment rate does not drop significantly, although high growth can be achieved. The government cannot rely on policies emphasizing high growth to lower the unemployment rate.

The insignificant impact of growth on the reduction in unemployment was associated with technological change and worker attitude. So far, technological change has led to capital-intensive technology that employs fewer workers. The process of production utilizes a high-tech machine that several skilled workers operate. Generally, high-tech machines have a higher efficiency than old machines (Sugiharti et al., 2017). High technology enables companies to produce output at a lower cost (Azemi et al., 2019). Therefore, employers



prefer high-tech machines to control production costs and raise competitiveness. Competitiveness is an essential element in enhancing market share and profit.

Furthermore, unemployment also relates to the wage rate. The wage rate is resulted from the interaction of labor demand and labor supply. Indonesia's labor market is characterized by a labor surplus, which is indicated by the excess number of job seekers above the number of available jobs. Labor surplus makes the wages and employment rate to be determined by the demand for labor. An increase in the labor demand promotes a rise in the wage rate. The higher wages indicate a better quality of job vacancies. Many jobs offer high wages, so job seekers are attracted to enter the labor market. Therefore, some job seekers who used to be picky about jobs are now willing to enter the labor market. It means that an increase in the wage rate leads to a decrease in the unemployment rate.

In addition, the unemployment rate is also related to the attitude of workers. Workers can be grouped into several groups based on their characteristics, such as gender, education level, and age. This means that the attitudes of workers can be different from one another. Generally, male workers are the primary source of family income. His attitude may differ from that of female workers who do not have a similar role. Male workers always try to find a job to fulfill their family needs, while female workers can stop their activities if there is no job. Besides, the education level also affects the attitude of workers. Educated workers tend to be picky about jobs. They refuse low-paying jobs and want jobs that match their educational background. If there are no job vacancies they want, they choose to wait for new vacancies that offer suitable jobs. While waiting for a new job vacancy, they are unemployed. Meanwhile, uneducated workers are aware of their limitations and are willing to accept any job. Therefore, the unemployment rate of uneducated workers is lower than that of educated workers.

The workers' perceptions of job vacancies also vary by age. The attitude of youth workers differs from that of adult workers. The youth workers do not yet have families, so there is no rush to get a job. During the job search process, they do not have any income, but they still get funds from their parents to fulfill their needs. Besides, the compulsory education program gives youth workers a better education than adult workers. These two factors encourage youth workers to tend to be picky about jobs. They want jobs that match their educational background. If suitable jobs have not arrived, they tend to wait for another vacancy matching their wants. These factors may be the leading cause of the high unemployment of youth workers.

By contrast, adult workers face different conditions. Generally, adult workers are married, so they must meet their families needs. As is the prevailing culture in Indonesia, married workers no longer receive financial assistance from their parents. Therefore, they must have a job as the primary income source to meet their family's needs. As a result, they always want to be employed and not turn down a job even if it is not to their liking. In addition, they have work experience that supports them in finding new jobs when unemployed.

Apart from the above factors, the unemployment rate is also influenced by government policies, including economic policy. The New Order government lasted for a long period so that they were able to design sustainable economic development. In the economic field, the New Order government designed the development of the industrial sector according to the stages contained in the five-year development plan. Meanwhile, the New Order government actively promoted labor-intensive programs to reduce unemployment. This condition differs from the government in the Reform era. The government changed in line with the general election results held every five years. Economic Development is carried out following the work program of the elected president, so the development program is not sustainable from time to time.

Furthermore, this study identifies the impact of age on the relationship between growth and unemployment. This study aims to determine whether there are differences in the relationship between growth and unemployment between youth and adult workers. This analysis is accompanied by the impact of a government policy change on manpower.



METHODS OF RESEARCH

Secondary data published by the Central Bureau of Statistics (BPS) is utilized in this study. This research focuses on the relationship between economic growth and youth and adult unemployment. This relationship is supplemented by the wage rates as a covariate. The research data are time series, covering the growth, youth unemployment, adult unemployment, and wage rates in Indonesia from 1990-2021. The research period covers the New Order and Reform era, so this study analyzes the effect of government policies on unemployment rates in the New Order and Reform periods.

In this study, growth refers to the percentage increase in GDP at constant prices in 2010. Youth unemployment is the unemployment rate for workers aged 20 to 24 and those aged 25 to 29. Meanwhile, adult unemployment shows the unemployment rate for workers aged 40 to 44 and those aged 45 to 49. The wage rate refers to the wages of production workers under supervisors in the manufacturing industry.

This study uses regression analysis based on the Fully Modified Ordinary Least Square (FMOLS) model. Prior to further analysis, it is necessary to conduct a cointegration test to determine whether there is a long-term equilibrium relationship between several variables (Hassler & Hosseinkouchack, 2016). This cointegration test uses the Johansen method. If the results show an equilibrium relationship between economic variables, then the next step is regression to analyze the impact of growth on youth and adult unemployment. The regression model is expressed in the following equation:

$$UNEMP_t = \beta_0 + \beta_1 GROWTH_t + \beta_2 WAGE_t + \beta_3 DUMMY + e_t$$

Sequentially, UNEMP is the unemployment rate which includes youth and adult unemployment, GROWTH is economic growth, WAGE is the wage rate, and e is the error term. The DUMMY exhibit a change of government from the New Order to the Reform Order (DUMMY = 0 for the New Order and is 1 for the others).

RESULTS AND DISCUSSION

The statistical description exhibits that youth unemployment is higher than adult unemployment. The average youth unemployment was 17,146 percent (20-24 years) and 7,951 (25-29 years). While adult unemployment is relatively low, the average adult unemployment is only 1.76 percent (40-44 years) and 1.526 percent (45-49 years). The highest unemployment rate of 27.2 percent occurred in youth workers aged 20-24 in 2006. By contrast, the lowest unemployment rate of 0.2 percent occurred in adult workers aged 40-44 in 1991 (Table 1). In general, the unemployment rate was low during the New Order era. The unemployment rate in the Reform era was higher than that in the New Order. This condition is related to government policies on manpower. A change in government policy also impacts the unemployment rate. Continuous policies in the New Order are better than discontinuous policies in Reform Order due to changes in government.

Generally, economic growth during the New Order era was higher than during the Reform era. The highest growth of 8.22 was achieved in 1995 when the New Order Regime came to power. However, the monetary crisis in 1998 caused a decline in macroeconomic performance with a growth of minus 13 percent. This crisis became one of the factors driving the collapse of the New Order Government. Economic growth of minus 13% was the lowest growth rate during the New Order and Reform Era. Conversely, the lowest wages occurred in 1990, with a wage rate of IDR 88,700. Meanwhile, the highest wage rate of IDR 2,842,000 will occur in 2021. The wage rate has increased from year to year in line with the inflation rate and an increase in labor productivity.

The cointegration test aims to determine whether there is a long-term equilibrium relationship between economic variables. Based on the results of the Johansen cointegration test, it can be seen that among the three variables in this study, there is a cointegration relationship at a significance level of $\alpha = 5\%$ (Tables 2a and 2b). The Trace statistic and



Maximum Eigen Value are smaller than the critical value for youth and adult unemployment, so there is cointegration between variables in the model. Thus, there is a long-term equilibrium relationship between economic growth, unemployment, and the wage rate.

Table 1 – The Statistical Description

n/n	UNEMP 20-24	UNEMP 25-29	UNEMP 40-44	UNEMP 45-49	GROWTH	WAGE
Mean	17.146	7.951	1.766	1.526	4.701	1131.547
Median	16.705	7.565	2.045	1.655	5.120	942.700
Maximum	27.200	12.940	3.920	3.540	8.220	2842.000
Minimum	9.540	3.270	0.200	0.210	-13.130	88.070
Std. Dev.	4.619	2.532	1.021	0.885	3.788	939.989

Table 2a – Johansen's Cointegration Test (Youth Unemployment)

Hypothesis	Trace Statistic	5% Critical Value	Maximum Eigen Value	5% Critical Value
$r = 0$	80.765*	47.856	45.062*	27.584
$r \leq 1$	35.703*	29.797	23.482*	21.132

Table 2b – Johansen's Cointegration Test (Adult Unemployment)

Hypothesis	Trace Statistic	5% Critical Value	Maximum Eigen Value	5% Critical Value
$r = 0$	80.765*	47.856	45.062*	27.584
$r \leq 1$	35.703*	29.797	23.482*	21.132

Furthermore, the results show that the coefficient determination in youth unemployment is relatively low. The coefficient determination in the youth unemployment aged 20-24 years is 0.273, while in the youth unemployment aged 25-29 years is 0.448. Meanwhile, the value of R^2 in adult unemployment is relatively high. The magnitude of R^2 in adult unemployment aged 40-44 years is 0.607, while in the adult unemployment aged 45-49 years is 0.631. The regression result exhibits that economic growth has no effect on youth unemployment. The opposite results occurred in adult unemployment. Economic growth has a negative effect on adult unemployment, while the wage rate has no impact. Furthermore, the significant DUMMY variable indicates the influence of the change of government from the New Order to the Reform Order on the unemployment rate (Table 3).

Table 3 – The Estimation Result

No	Variable	Youth Worker		Adult Worker	
		20-24	25-29	40-44	45-49
1	GROWTH	-0.313 (0.335)	-0.161 (0.138)	-0.070* (0.040)	-0.054* (0.029)
2	WAGE	-0.004* (0.002)	-0.002* (0.001)	-0.0002 (0.000)	-0.0001 (0.000)
3	DUMMY	14.019* (3.752)	6.631* (1.544)	1.345* (0.452)	1.605* (0.330)
4	CONSTANT	14.887* (2.898)	6.186 (1.192)	0.837 (0.349)	0.760 (0.255)
	R^2	0.273	0.448	0.607	0.631

Note: * significant at ($\alpha=5\%$). Numbers in parentheses are standard errors.

The results show that in the adult unemployment group, economic growth negatively affects the unemployment rate. However, for youth unemployment, economic growth has no impact on the unemployment rate. In the adult unemployment, economic growth of 1 percent was followed by a decrease in unemployment by 0.07 percent (age group 40-44 years) and by 0.054 percent (age group 45-49 years). Economic growth exhibits an increase in economic output. Higher output requires additional inputs, including labor. This means that the growth is followed by a rise in labor demand expressed by job vacancies. The response to economic growth differs between adult workers and young workers. Adult workers immediately respond to job vacancies to earn wages as a source of their family income.



Adult workers already have families, so they must be responsible for fulfilling their family's needs. They always try to get a job as a source of income. So far, Indonesia does not implement social benefits for the unemployed, so the unemployed do not get any income. Thus, they have to get a job as a source of income for their family. Therefore, Okun's law applies to adult unemployment. This result is in line with the findings of Yahia (2018) and Louail & Hamida (2021) that an increase in economic output is followed by a decrease in unemployment.

Different conditions occur in youth unemployment. They are not married, so they have no family responsibilities. Generally, the needs of unmarried youth are borne by their parents. They can still depend on their parents to fulfill their needs, so they do not have to work temporarily. This group generally has a higher education level than the adult worker, so they tend to be picky about jobs. They tend to wait for job vacancies that match their educational background. They want a job that is comfortable and does not require extra effort. If the existing job vacancies do not match their wishes and educational background, they tend to wait for new job vacancies. While waiting for the arrival of new job vacancies, they are included in the unemployed group. This finding contradicts Okun's law. Economic growth was not followed by a decrease in youth unemployment. The result is in line with the findings of Bankole & Fatai (2013) and Valadhani & Smyth (2015) that an increase in economic output is not followed by a decrease in the unemployment rate.

Furthermore, wages negatively affect youth unemployment, while for adult unemployment, wages has no effect. An increase in wages rate of 1 thousand rupiahs leads to a decrease in the unemployment rate of 0.004 percent (youth unemployment aged 20-24 years) and 0.002 percent (youth unemployment aged 25-29 years). Youth workers have a higher education level than adult workers, so they are also picky about their jobs. They want comfortable or high-paying jobs. A higher wages indicates better job vacancies. It exhibits that the companies are willing to pay higher wages. This encourages youth workers to enter the labor market so that youth unemployment is reduced. This finding contradicts the results of Gorry (2013) that an increase in minimum wages leads to an increase in unemployment for youth workers.

By contrast, wage rates do not affect adult unemployment. Changes in the wage are not lead to changes in the adult unemployment rate. Unemployed adult workers will immediately respond to existing job vacancies. They already have a family, so they have to find occupation as a source of family income. Family needs make them no longer be picky about a job. Moreover, adult workers already have work experience to adjust to the occupation offered. Work experience makes them able to work in various fields. They realize there is a phenomenon of labor surplus in the Indonesian labor market. If they do not immediately respond to the job vacancies offered, these vacancies will be filled by other job seekers. Family needs and excess labor supply make adult workers not consider the wage rates. So far, Indonesia has no social benefits for the unemployed. The unemployed do not earn any income. Therefore, adult workers tend to accept the offered jobs even though the wages are not suitable for their wishes. Thus, changes in the wage rate have no impact on adult unemployment. This results in line with Ten & Wang (2020) that higher minimum wages slightly increase unemployment rates among young workers but do not affect the older workforce.

Furthermore, the dummy variable significantly affects both youth and adult unemployment. This exhibited that government policies have an impact on the unemployment rate. The New Order government has been in power for a long time and has continuously implemented a labor-intensive program to reduce the unemployment rate. Meanwhile, the government in the Reform era changed in line with the results of the general election. Policies in manpower have changed according to the elected president's working program. This makes the absence of continuity of policies in the manpower. The dummy variable is 1 for the Reform Order and 0 for the others, so the intercept magnitude in the Reform Era is greater than that in the New Order. The discontinuity of manpower policies during the Reform era led to high unemployment rates in this period.



Table 4 – The Result of t-Test

Ages	UNEMP 20-24	UNEMP 25-29	UNEMP 40-44	UNEMP 45-49
New Order Era	12.669	5.094	0.448	0.376
Reform Era	18.898	9.069	2.282	1.977
t value	-4.283*	-5.634*	-7.882*	-8.034*

The unemployment difference between the New Order and Reform Period is exhibited in Table 4. Based on this table, there is a significant t value indicating that the means unemployment rate in the New Order era was lower than that in the Reform Era for youth and adult unemployment.

CONCLUSION

Economic growth negatively affects adult unemployment but has no impact on youth unemployment. An increase in growth leads to a decrease in the adult unemployment rate. Higher economic growth requires input, including labor, exhibited in more job vacancies. The adult worker immediately responds to job vacancies due to their family needs. Meanwhile, youth workers tend to be picky about jobs. If the job vacancies are unsuitable, they wait for new job vacancies. While waiting for a new job vacancy, they are included among the unemployed. Thus, Okun's law applies to adult unemployment. In contrast, in the case of youth unemployment, Okun's law is not supported. Meanwhile, the wage negatively affects youth unemployment. An increase in wages indicates that there are better job vacancies. This encourages the youth workers to enter the labor market, so the youth unemployment rate falls. Conversely, due to family needs, adult workers immediately respond to job vacancies without paying attention to the wage rate. Therefore, in adult unemployment, changes in wage rates have no impact. Furthermore, the change in government from the New Order to the Reform Order impacts youth and adult unemployment. The continued manpower policies made the unemployment rate in the New Order lower than that in the Reform Order.

Youth unemployment does not relate to the absence of job vacancies but to the attitude of being picky about a job. Thus, the government should improve the character of young workers. Character improvement encourages them to be willing to enter the job market even though the available job vacancies are unsuitable for their expectations. It would be better if they entered the labor market to improve their experience while waiting for better job vacancies to decrease the youth unemployment rate.

REFERENCES

1. Anbaraki, L., & Ismaili, B. (2021). Investigating the relationship between drug addiction among youth and unemployment and its impact on urban security in bushehr province. *Boushehr Danesh Entezami*, 10(39), 53-64.
2. Asenjo, A., & Pignatti, C. (2019). Unemployment insurance schemes around the world: Evidence and policy options. In International Labour Office (Issue 49).
3. Azemi, F., Šimunović, G., Lujčić, R., Tokody, D., & Rajnai, Z. (2019). The use of advanced manufacturing technology to reduce product cost. *Acta Polytechnica Hungarica*, 16(7), 115-131. <https://doi.org/10.12700/APH.16.7.2019.7.7>.
4. Ball, L., Furceri, D., Leigh, D., & Loungani, P. (2019). Does One Law Fit All? Cross-Country Evidence on Okun's Law. *Open Economies Review*, 30(7), 841-874.
5. Bankole, A. S., & Fatai, B. O. (2013). Empirical Test of Okun's Law in Nigeria. *International Journal of Economic Practices and Theories*, 3(3), 227-231.
6. Bođa, M., & Považanová, M. (2021). Output-unemployment asymmetry in Okun coefficients for OECD countries. *Economic Analysis and Policy*, 69, 307-323.
7. Cristescu, A. (2017). The Impact of Education on The Unemployment Rate in The Southern European Model. *Romanian Journal of Regional Science*, 11(1), 62-75.
8. Gao, G., Liu, B., & Kouassi, I. (2017). The contemporaneous effect of unemployment on



- crime rates: the case of Indiana. *Southwestern Economic Review* 44:99-107, 44, 99-107.
9. Gorry, A. (2013). Minimum wages and youth unemployment. *European Economic Review*, 64, 57-75.
 10. Habibi, M., & Juliawan, B. H. (2018). Creating Surplus Labour: Neo-Liberal Transformations and the Development of Relative Surplus Population in Indonesia. *Journal of Contemporary Asia*, 48(4), 649-670.
 11. Hashmi, S. M., Khushik, A. G., Gilal, M. A., & Yongliang, Z. (2021). The Impact of GDP and Its Expenditure Components on Unemployment Within BRICS Countries: Evidence of Okun's Law From Aggregate and Disaggregated Approaches. *SAGE Open*, 11(2). <https://doi.org/10.1177/21582440211023423>.
 12. Hassler, U., & Hosseinkouchack, M. (2016). Panel cointegration testing in the presence of linear time trends. *Econometrics*, 4(4), 2-16. <https://doi.org/10.3390/econometrics4040045>.
 13. Hjazeen, H., Seraj, M., & Ozdeser, H. (2021). The nexus between the economic growth and unemployment in Jordan. *Future Business Journal*, 7(1), 1-8. <https://doi.org/10.1186/s43093-021-00088-3>.
 14. Knotek, E. S. I. (2007). How useful is Okun's Law? *Economic Review-Federal Reserve Bank of Kansas City*, 92(4), 73-104.
 15. Lal, I., Muhammad, S. D., Jalil, M. A., & Hussain, A. (2014). Test of Okun ' s Law in Some Asian Countries Co-Integration Approach. *European Journal of Scientific Research* ISSN 1450-216X Vol.40 No.1 (2010), pp.73 -80, 40(1), 73-80.
 16. Louail, B., & Hamida, H. B. H. (2021). Asymmetry Relationship between Economic Growth and Unemployment Rates in the Arab countries: Application of the OKUN Law during 1960-2017. *Management*, 25(2), 1-21. <https://doi.org/10.2478/manment-2019-0070>.
 17. Nagelhout, G. E., Hummel, K., de Goeij, M. C. M., de Vries, H., Kaner, E., & Lemmens, P. (2017). How economic recessions and unemployment affect illegal drug use: A systematic realist literature review. *International Journal of Drug Policy*, 44, 69-83. <https://doi.org/10.1016/j.drugpo.2017.03.013>.
 18. Sugiharti, L., Purwono, R., Primanthi, M. R., & Padilla, M. A. E. (2017). Indonesian productivity growth: Evidence from the manufacturing sector in Indonesia. *Pertanika Journal of Social Sciences and Humanities*, 25(November), 29-44.
 19. Ten, G. K., & Wang, S. (2020). Minimum Wage and Unemployment: Evidence from Russia. <https://doi.org/https://dx.doi.org/10.2139/ssrn.3612515>.
 20. Tesfaselassie, M. F., & Wolters, M. H. (2018). The Impact of Growth on Unemployment in a Low vs. High Inflation Environment. *Review of Economic Dynamics*, 28(April), 34-50.
 21. Valadkhani, A., & Smyth, R. (2015). Switching and asymmetric behaviour of the Okun coefficient in the US: Evidence for the 1948-2015 period. *Economic Modelling*, 50 (July), 281-290. <https://doi.org/10.1016/j.econmod.2015.07.001>.
 22. Wahyuningrum, F., & Soesilowati, E. (2021). The Effect of Economic Growth, Population and Unemployment on HDI. *Indonesian Journal of Development Economics*, 4(2), 1217-1229.
 23. Yahia, A. K. (2018). Estimation of Okun Coefficient for Algeria. *International Journal of Youth Economy*, 2(1), 1-16. <https://doi.org/10.18576/ijye/020102>.