

Determining the Phillips Curve and Okun's Law in Indonesia



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ABSTRACT: This research aims to analyze the direct effect of inflation on growth, the direct effect of inflation on unemployment, the direct impact of economic growth on unemployment, and the indirect effect of inflation on unemployment through economic growth as an intervening variable. The analysis uses data from 34 provinces in Indonesia spanning the period from 2014 to 2022, utilizing Eviews for statistical processing. The Fixed Effects Model (FEM) was selected for Model 1, while the Random Effects Model (REM) was chosen for Model 2. This research found that inflation has a direct positive and significant effect on economic growth, inflation has a direct positive and significant impact on economic growth, economic growth has a direct negative and significant effect on unemployment, and indirectly, inflation has a negative and significant impact on unemployment when mediated by economic growth. The effect of inflation on unemployment, both directly and indirectly, follows the Phillips Curve, and the impact of economic growth on unemployment follows Okun's Law.

KEYWORDS: Inflation, economic growth, unemployment, Phillips Curve, Okun's Law.

I. INTRODUCTION

Open unemployment refers to a situation where people who are capable and eager to work struggle to secure jobs that align with their skills and preferences. It's a significant economic issue, indicating a disparity between the availability of jobs and the workforce seeking employment. This problem can arise due to several reasons, like shifts in the economy's structure, skill mismatches, or challenges in distributing jobs across different regions. The rate of open unemployment serves as a crucial gauge of a region's economic well-being, impacting social stability and guiding government strategies aimed at addressing employment challenges. The number of open unemployed in Indonesia during the 2014-2022 period can be seen in Table 1.

Table 1. Number and Percentage of Open Unemployment in Indonesia 2014-2022

Year	Quantity (million person)	Persen (%)
2014	7,244.91	5.94
2015	7,560.82	6.18
2016	7,031.78	5.61
2017	7,040.32	5.50
2018	7,073.39	5.30
2019	7,104.42	5.23
2020	9,767.75	7.07
2021	9,102.05	6.49
2022	8,425.93	5.86

Source: Badan Pusat Statistik (2023)

It can be seen from Table 1 that in 2015 there was an increase in the number of open unemployed from 7,244.91 million people to 7,560.82 million people, or from 5.94% to 6.18% of the total workforce in Indonesia. The increase in the number of open unemployed was caused by the decline in the value of the IDR currency against the USD (Badan Pusat Statistik, 2015), causing the price of raw materials for industries that use imported raw materials to become increasingly expensive. Many industries have had

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to reduce the amount of production so they also have to reduce the number of workers they employ. In addition, due to a decrease in demand for the products of several types of industries, such as garments, textiles, steel, and shoes (Jefriando, 2015), by other countries, these industries have had to reduce the number of workers employed.

In 2016, there was a decrease in the count of those openly unemployed. However, from 2017 to 2019, while the number of open unemployed increased, the percentage of this group decreased due to a rise in the overall workforce each year. The momentum shifted dramatically in 2020 with the onset of the COVID-19 pandemic, causing a significant surge in open unemployment. The limitations imposed on production activities led to widespread operational constraints, forcing many businesses to reduce their workforce.

Although there were reductions in both the count and percentage of open unemployed in 2021 and 2022, they remained higher compared to the pre-COVID levels. This suggests that the economy hadn't fully recuperated to its pre-pandemic state by 2022.

To comprehend the dynamics of the Indonesian economy, a thorough understanding of the Phillips curve and Okun's Law is crucial. In the context of Indonesia's dynamic and continuously evolving economy, an in-depth exploration of the Phillips curve and Okun's Law is increasingly vital. Unique factors such as the economic structure, monetary and fiscal policies, and labor market dynamics all contribute to shaping the relationships between inflation, economic growth, and unemployment in Indonesia.

Several prior studies have explored the connection between inflation, economic growth, and unemployment, producing varying results. These inconsistencies indicate a research gap, which is further detailed in the following section. Research on inflation which is linked to economic growth has been carried out by several researchers. Inflation has a positive and significant impact on economic growth is the result of research conducted by Umaru et al. (2014), Cuaresma & Silgoner (2014), Ume et al. (2016), Singh & Verma (2016), Sumon & Miyan (2017), Cahyadin (2017), Kryeziu & Durguti (2019), and Cili & Alkhaliq (2022). Meanwhile Adermola & Badiru (2016) found that inflation had an insignificant positive effect on economic growth. On the other hand, inflation significantly reduces economic growth is the result of research conducted by Msaraka & Hongzhong (2015), Asfuroglu & Elgin (2015), Bhaduri (2016), Mohseni & Jouzaryan (2016), Loi & Abou-Zaid (2016), Akinsola & Odhiambo (2017), Al-Khulaifi (2018), Muryani & Pamungkas (2018), Overstreet (2019), and Bashir (2022). While Kunkuaboor et al. (2021), and Yismaw (2019) found that inflation has a negative and insignificant effect on economic growth.

Research on the relationship between inflation and unemployment has been conducted by several scholars. Sabir & Naz (2015), Anshori & Suparta (2018), Hasan & Sun'an (2019), and Suparta et al. (2021) found that inflation increases the unemployment rate. Conversely, studies by Doğan (2012), Thayaparan (2014), Buba & Ishak (2014), Macharia & Otieno (2015), Ozcelebi & Ozkan (2017), Kasseh (2018), and Abu (2019) concluded that inflation can reduce unemployment. Additionally, Nurdiana et al. (2020) discovered that inflation had an insignificant negative effect on the unemployment rate.

II. LITERATURE REVIEW

Some theories support this research, so this section explains inflation, economic growth, unemployment, the Phillips curve, and Okun's law.

A. Inflation

Inflation is essentially when prices for goods and services across the economy rise consistently over time. It's not just about a few items becoming more expensive; it's about a widespread increase in prices. For example, if the cost of bread, milk, gas, and housing all go up and keep rising, that's inflation. It's important to note that inflation affects the entire economy, making everything more expensive, not just a select few items (Bank Indonesia, 2020).

Based on the source, inflation is categorized into two types: cost-push inflation and demand-pull inflation. Demand-pull inflation occurs when the demand for goods and services increases overall. This can result from factors like higher government spending, an expanded money supply, lower interest rates that encourage borrowing and spending, and increased consumer confidence leading to more expenditure. When demand exceeds supply, prices rise. Conversely, cost-push inflation arises from elevated production costs. This can be due to higher wages, increasing prices for raw materials, supply chain disruptions, and the increased costs of imported goods resulting from currency depreciation. These higher production costs force manufacturers to raise prices to sustain their profit margins, causing inflation Welch & Welch (2010).

B. Economic Growth

According to Kuznets (Jhingan, 2012), economic growth is defined as a long-term increase in a country's capacity to provide a greater variety of economic goods to its population. This growth is driven by technological progress and the necessary institutional and ideological adjustments. Economic growth is evidenced by an increase in Gross Domestic Product (GDP) at constant prices from one year to the next. In Indonesia, GDP is the sum of the added value produced by 17 economic sectors. Each sector contributes to the formation of GDP, and with every increase in GDP, there is a corresponding increase in the added value generated by some or all of these sectors, leading to sectoral growth.

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C. Unemployment

Unemployment is defined as the gap between the labor supplied by households and the labor demanded by companies (Kim & Lim, 2018). The amount of labor supplied exceeds the demand for labor in an economy. The unemployment rate serves as a valuable measure of the underutilization of available labor, highlighting the economy's failure to create jobs for individuals who are willing and actively seeking work but remain unemployed. This metric is also included as one of the indicators for measuring progress towards achieving the Sustainable Development Goals (SDGs) (ILO, 2020).

D. Phillips Curve

The linkage between inflation and unemployment is often examined through the lens of the Phillips Curve (Phillips, 1958). This economic concept suggests an inverse relationship between the rate of inflation and the rate of unemployment, indicating that as inflation increases, unemployment tends to decrease, and vice versa.

E. Okun's Law

The relationship between the unemployment rate and economic growth was first introduced by Arthur M. Okun in his 1962 work, "Potential GNP: Its Measurement and Significance." Okun discovered a negative relationship between the unemployment rate and economic growth, a finding that became known as Okun's Law (Okun, 1962).

III. RESEARCH METHODS

A. Data

This research uses panel data from 34 provinces in Indonesia for the 2014-2022 period. This data includes inflation, economic growth, and the open unemployment rate in Indonesia.

B. Conceptual Framework

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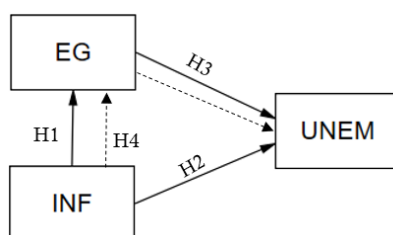


Figure 1. Conceptual Framework

C. Hypothesis

Based on the framework, there are four hypotheses in this research as follows:

H1 : Inflation directly impacts economic growth

H2 : Inflation directly affects unemployment

H3 : Economic growth directly influences unemployment

H4 : Inflation indirectly affects unemployment, with economic growth serving as an intervening variable.

D. Regression Analysis

Based on the framework, there are two regression equations are direct influence, namely:

$$EG = f(INF) \quad (1)$$

$$UNEM = f(INF, EG) \quad (2)$$

Based on regression equations 1 and 2, the indirect effect of inflation on the unemployment is calculated through the economic growth as an intervening variable. The conceptual framework is analyzed using Eviews software. The objective is to identify the most suitable model among three options: the Common Effect Model, Fixed Effect Model, and Random Effect Model. A model selection test is conducted to determine the optimal model. Based on the test results, the regression equation is formulated as follows:

$$EG = C(1) + C(2)*INF + [CX=R] \quad (3)$$

$$UNEM = C(1) + C(2)*INF + C(3)*EG + [CX=R] \quad (4)$$

Where: Inflation (INF), Economic growth (EG), Unemployment rate (UNEM), [CX=R]: Random Error.

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IV. RESULTS AND DISCUSSION

A. Selection of Model

Model 1

The first model suggests that economic growth is influenced by inflation. Expressing this relationship in a functional form, we get the following equation:

$$EG = f(INF).$$

To determine the optimal model selection, the initial step involves conducting the Chow test, which assists in the selection of the best model among the Fixed Effect Model (FEM) and the Common Effect Model (CEM), as illustrated in Table 2.

Table 2. Chow Test for Model 1

Effects Test	Statistic	d.f.	Prob.
Cross-section F	2.210905	(33,271)	0.0003
Cross-section Chi-square	72.952273	33	0.0001

Source: Output analysis

According to the information provided in Table 2, the probability associated with the Cross-section Chi-square is 0.0000, which is less than 0.05. Consequently, the null hypothesis (H₀) is rejected, indicating that the Fixed Effect Model (FEM) is the preferred model.

After selecting the FEM as the best model in the Chow test, the analysis proceeded to conduct the Hausman test, as shown in Table 3. The objective of the Hausman test was to determine the most appropriate model between the Fixed Effect Model (FEM) and the Random Effect Model (REM).

Table 3. Hausman Test for Model 1

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.757502	1	0.3841

Source: Output analysis

Based on the results of the Hausman test presented in Table 3, the probability associated with the cross-section random chi-square statistic is 0.3841, which exceeds the significance level of 0.05. Therefore, we accept the null hypothesis (H₀), indicating that the Fixed Effect Model (FEM) is the preferred model.

Conclusively, based on both the Chow test and the Hausman test, the best model for model 1 is determined to be the Fixed Effect Model (FEM).

Model 2

The second model posits that unemployment is influenced by both inflation and economic growth. If we were to express this relationship in a functional form, it would take the following equation:

$$UNEM = f(INF, EG)$$

Table 4. Chow Test for Model 2

Effects Test	Statistic	d.f.	Prob.
Cross-section F	35.144637	(33,270)	0.0000
Cross-section Chi-square	510.055801	33	0.0000

Source: Output analysis

Based on the information from Table 4, the probability associated with the Cross-section Chi-square is 0.0000, which is less than the significance level of 0.05. Therefore, we reject the null hypothesis (H₀), suggesting that the Fixed Effect Model (FEM) is the preferred model.

Following the selection of FEM as the best model in the Chow test, the analysis proceeded to conduct the Hausman test, as indicated in Table 5.

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Table 5. Hausman-Test for Model 2

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	3.367195	2	0.1857

Source: Output analysis

Based on the Hausman test results from Table 5, the probability associated with the random cross-section chi-square statistic is 0.1857, which exceeds the significance level of 0.05. Therefore, we accept the null hypothesis (H₀), indicating that the Random Effect Model (REM) is the preferred model.

Conclusively, based on the results of both the Chow test and the Hausman test, the Random Effect Model (REM) is determined to be the best model for model 2.

B. Regression Analysis

Model 1

Based on the results of the model selection test, the Fixed Effect Model (FEM) has been identified as the best model. The estimated regression coefficients are presented in Table 6.

Table 6. Model 1 Dependent Variable: EG?

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.273021	0.298209	10.97561	0.0000
INF?	0.316603	0.058277	5.432715	0.0000

Source: Output analysis

Model 2

Based on the results of the model selection test, the Random Effect Model (REM) has been identified as the best model. The estimated regression coefficients are presented in Table 7.

Table 7. Model 2 Dependent Variable: UNEM?

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.700943	0.291050	19.58752	0.0000
INF?	-0.022096	0.015787	-1.399625	0.1626
EG?	-0.074090	0.015581	-4.755209	0.0000

Source: Output analysis

The direct effect of the inflation on the economic growth

Model 1 is shown in Table 6 where there is only a direct effect of inflation on the economic growth. Based on Table 6, it can be explained that inflation has a positive and significant effect on the economic growth. This means that low inflation causes low levels of economic growth, and vice versa. Dengan demikian, hasil penelitian ini mendukung hasil penelitian yang dilakukan oleh Umaru et al. (2014), Cuaresma & Silgoner (2014), Ume et al. (2016), Singh & Verma (2016), Sumon & Miyan (2017), Cahyadin (2017), Kryeziu & Durguti (2019), Cili & Alkhaliq (2022) yang menyatakan bahwa inflasi berpengaruh positif dan signifikan terhadap pertumbuhan ekonomi.

The findings of this research indicate that the Indonesian government has effectively managed the inflation rate through the Regional Inflation Control Team (TPID) in each region. One of the primary objectives of economic policy is to maintain inflation at a moderate level to support economic growth. Keeping inflation controlled at a relatively low level can foster economic growth. A managed inflation rate encourages people to spend their money more quickly, knowing that its value will decrease over time. This increased spending boosts consumer demand, stimulating economic activity and growth. Additionally, at controlled inflation levels, individuals are more likely to invest their money rather than save it, as the value of cash tends to decline over time, promoting long-term economic growth.

The direct effect of the inflation on the unemployment

In Table 7, it's evident that inflation demonstrates an insignificant impact on the unemployment rate, indicated by the negative regression coefficient of -0.022096. Interestingly, an increase in the inflation rate appears to have the potential to reduce the unemployment rate. These findings align with Nurdiana et al.'s (2020) research, which similarly concluded that inflation had an

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insignificant negative effect on the unemployment rate. The study's results suggest that at a controlled inflation rate, there's a boost in public demand. This increase in demand prompts producers to raise their output levels in response to heightened consumer demand. Consequently, this surge in production can lead to the creation of more jobs, thereby reducing the unemployment rate.

The direct effect of economic growth on the unemployment

The findings presented in Table 7 highlight a significant and negative relationship between economic growth and the unemployment rate, as indicated by the regression coefficient of -0.074090. In practical terms, this suggests that attempts to limit economic growth might inadvertently lead to an increase in the unemployment rate. Conversely, fostering economic growth could potentially help decrease the unemployment rate. These research results align with the findings of Olusegun & Stober (2015), Al-hosban & Edienat (2017). Furthermore, these findings resonate with Okun's Law, which underscores the inverse relationship between unemployment and economic growth.

Indirect Effect of Inflation on unemployment

In mediation analysis, one common approach to determining the significance of an indirect effect is by calculating the t-value associated with this effect. Here is a general formula used to compute the t-value of the indirect effect (Preacher & Leonardelli, 2023):

$$t - value = \frac{ab}{\sqrt{b^2S_a^2 + a^2S_b^2}}$$

Where:

a is the effect of the inflation on economic growth

b is the effect of the economic growth on unemployment

S_a is the standard error of the effect of inflation on economic growth

S_b is the standard error of the effect of economic growth on unemployment

Table 8 is an online table that must be completed to apply the Sobel formula for mediation analysis. The calculation results provide an assessment of the indirect impact of inflation on unemployment through economic growth. The results are displayed in a table showing coefficients, standard errors, t-statistics, and p-values for direct and indirect effects.

Table 8: Sobel-Test

	Input:		Test statistic:	Std. Error:	p-value:
a	0.316603	Sobel test:	-3.57812096	0.00655571	0.00034607
b	-0.074090	Aroian test:	-3.54428516	0.00661829	0.00039368
s _a	0.058277	Goodman test:	-3.61294468	0.00649252	0.00030274
s _b	0.015581	Reset all	Calculate		

Source: Output analysis from <http://www.quantpsy.org/sobel/sobel.htm>

Examining Table 8 reveals a notable t-value of -3.578 alongside a low p-value of 0.0003, indicating that inflation has an indirect and noteworthy negative impact on the unemployment rate through economic growth. Interestingly, higher inflation seems to correlate with a significant decrease in the unemployment percentage. Conversely, if the aim is to decrease the unemployment rate, government policies should focus on measures that could raise the inflation rate.

The surge in unemployment during 2020 and 2021 wasn't driven by high inflation rates, but rather by the widespread impact of the Covid-19 Pandemic. This led to a shift to remote work and forced many companies to downsize their workforce. During this period, inflation was managed by regional TPID to alleviate the strain on communities due to a significant drop in income, reflected in Indonesia's negative economic growth of -2.07% in 2020. Out of the 34 provinces, only Sulawesi Tengah, Maluku Utara, and Papua saw positive economic growth in 2020.

CONCLUSIONS

Low levels of inflation can stimulate overall demand, prompting investors to boost their investments. This heightened economic activity leads to an increase in national production, potentially creating more jobs and lowering unemployment rates. Consequently, in economic settings where inflation is low, an uptick in inflation can drive economic growth. Model 1 demonstrates the direct positive effect and significance of inflation on economic growth.

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Inflation's direct impact on the unemployment rate is both negligible and negative. When inflation rises, it tends to lower the unemployment rate. This aligns with the concept known as the Phillips Curve.

Economic expansion has a direct and meaningful impact on unemployment, with higher economic growth correlating to a reduction in the unemployment rate. This phenomenon aligns with the principles of Okun's Law, indicating that as the economy grows, the likelihood of decreased unemployment increases.

Based on the Sobel-Test, indirectly, inflation shows a significant negative impact on the unemployment rate through economic growth. An increase in the inflation rate has the potential to cause a decrease in unemployment. Rising inflation causes economic growth to rise and then lowers the unemployment rate. This indirect effect also fits the Phillips Curve.

The effect of inflation on unemployment, both directly and indirectly, follows the Phillips Curve, and the impact of economic growth on unemployment follows Okun's Law.

REFERENCES

- 1) Abu, N. (2019). Inflation and Unemployment Trade-off: A Re-examination of the Phillips Curve and its Stability in Nigeria. *Contemporary Economics*, 13(1), 21–34. <https://doi.org/10.5709/ce.1897-9254.296>
- 2) Adermola, A. S., & Badiru, A. (2016). The Impact of Unemployment and inflation on Economic Growth in Nigeria (1981–2014). *International Journal of Business and Economic Sciences Applied Research (IJBESAR)*, 9(1), 47–55. <http://ijbesar.teiemt.gr>
- 3) Akinsola, F. A., & Odhiambo, N. M. (2017). Inflation and Economic Growth: A Review of the International Literature. *Comparative Economic Research*, 20(3), 41–56. <https://doi.org/10.1515/ce-2017-0019>
- 4) Al-hosban, S., & Edienat, M. (2017). The Validity of Okun's Law, Case of Jordan. *European Scientific Journal, ESJ*, 13(28), 470–486. <https://doi.org/10.19044/esj.2017.v13n28p470>
- 5) Al-Khulaifi, A. S. (2018). An Empirical Study on Inflation and Economic Growth in Qatar. *International Journal of Economics and Financial Research*, 4(9), 292–296. <https://doi.org/10.1111/j.1749-124X.2011.01259.x>
- 6) Anshori, Z., & Suparta, I. M. (2018). Pengaruh Pertumbuhan Ekonomi, Jumlah Angkatan Kerja, dan Inflasi Terhadap Tingkat Pengangguran di Provinsi Jawa Timur (2007-2016). *Jurnal Ekonomi & Bisnis*, 3(2), 677–686.
- 7) Asfuroglu, D., & Elgin, C. (2015). Growth Effects of Inflation Under the Presence of Informality. *Bulletin of Economic Research*, 68(4), 311–328. <https://doi.org/10.1111/boer.12057>
- 8) Badan Pusat Statistik. (2015). *BPS: Tingkat Pengangguran Terbuka Meningkat dari Tahun Sebelumnya*. Kompas.Com. <https://money.kompas.com/read/2015/11/05/171744726/BPS.Tingkat.Pengangguran.Terbuka.Meningkat.dari.Tahun.Sebelumnya>
- 9) Badan Pusat Statistik. (2023). *Jumlah dan Persentase Penduduk Bekerja dan Pengangguran 2022-2023*. <https://www.bps.go.id/indicator/6/1953/1/jumlah-dan-persentase-penduduk-bekerja-dan-pengangguran.html>
- 10) Bank Indonesia. (2020). *Inflasi*. <https://www.bi.go.id/id/moneter/inflasi/pengenalan/Contents/Default.aspx>
- 11) Bashir, D. (2022). The Impact of Inflation on Economic Growth in Nigeria. *International Journal of Accounting and Finance Studies*, 5(2), 81–92. <https://doi.org/10.22158/ijafs.v5n2p81>
- 12) Bhaduri, S. (2016). Revisiting the Growth-Inflation Nexus: A Wavelet Analysis. *Economic Notes*, 45(1), 79–89. <https://doi.org/10.1111/ecno.12049>
- 13) Buba, S., & Ishak, S. (2014). An Analysis of the Effect of Real Gross Domestic Product on Unemployment in Nigeria : (An ARDL- Approach). *Journal of Economics and Sustainable Development*, 5(14), 7–14.
- 14) Cahyadin, M. (2017). The relationship between macroeconomic variables and small-and-medium-enterprises in Indonesia. *Economic Journal of Emerging Markets*, 9(1), 40–50. <https://doi.org/10.20885/ejem.vol9.iss1.art5>
- 15) Cili, M. R., & Alkhaliq, B. (2022). Economic Growth and Inflation: Evidence from Indonesia. *Signifikan: Jurnal Ilmu Ekonomi*, 11(1), 145–160. <https://doi.org/10.15408/sjie.v11i1.19848>
- 16) Cuaresma, J. C., & Silgoner, M. (2014). Economic Growth and Inflation in Europe: A tale of Two Thresholds. *Journal of Common Market Studies*, 52(4), 843–860. <https://doi.org/10.1111/jcms.12117>
- 17) Doğan, T. T. (2012). Macroeconomic variables and unemployment: The case of Turkey. *International Journal of Economics and Financial Issues*, 2(1), 71–78.
- 18) Hasan, N., & Sun'an, M. (2019). The Effect of Inflation and Private Investment on Open Unemployment in North Maluku (Partial Adjudication Model (PAM) Approach). *Journal of Economics and Sustainable Development*, 10(12), 67–76. <https://doi.org/10.7176/JESD>
- 19) ILO. (2020). *Indicator description: Unemployment rate*. ILOSTAT. <https://ilostat.ilo.org/resources/methods/description-unemployment-rate/>

Determining the Phillips Curve and Okun's Law in Indonesia

- 20) Jefriando, M. (2015). *Ada 26.000 Karyawan Kena PHK per Agustus 2015*. DetikFinance. <https://finance.detik.com/berita-ekonomi-bisnis/d-3008350/ada-26-000-karyawan-kena-phk-per-agustus-2015>
- 21) Jhingan, M. L. (2012). *The Economics of Development and Planning* (40th Editi). Vrinda Publications (P) Ltd. - Delhi. <https://www.pdfdrive.com/the-economics-of-development-and-planning-40th-ed-e158057131.html>
- 22) Kasseh, P. A. (2018). The Relation between Inflation and Unemployment in the Gambia: Analysis of the Philips Curve. *Journal of Global Economics*, 06(02), 6–12. <https://doi.org/10.4172/2375-4389.1000294>
- 23) Kim, C. U., & Lim, G. (2018). Minimum wage and unemployment: An empirical study on OECD countries. *Journal of Reviews on Global Economics*, 7, 1–9. <https://doi.org/10.6000/1929-7092.2018.07.01>
- 24) Kryeziu, N., & Durguti, E. (2019). The impact of inflation on economic growth: The case of Eurozone. *Journal of Finance & Banking Studies*, 8(1), 1–09. <https://doi.org/10.20525/ijfbs.v8i1.297>
- 25) Kunkuaboor, Y. C., Adamu, M., Sommik-Duut, M., & Abdul-Seidu, F. (2021). The Effect of Inflation on Economic Growth in Ghana, 1995-2019: Post Democratic Analysis. *World Journal of Advanced Research and Reviews*, 12(03), 230–242. <https://doi.org/10.30574/wjarr.2021.12.3.0660>
- 26) Loi, H., & Abou-Zaid, A. S. (2016). Inflation and Growth: An Estimate of The Threshold Level of Inflation in the U.S. *IOSR Journal of Economics and Finance (IOSR-JEF)*, 7(6), 23–34. <https://doi.org/10.9790/5933-0706022334>
- 27) Macharia, M. K., & Otieno, A. (2015). Effect of Inflation on Unemployment In Kenya. *International Journal of Science and Research (IJSR)*, 6(6), 1980–1984. <https://doi.org/10.21275/ART20174660>
- 28) Mohseni, M., & Jouzaryan, F. (2016). Examining the Effects of Inflation and Unemployment on Economic Growth in Iran (1996-2012). *Procedia Economics and Finance*, 36(16), 381–389. [https://doi.org/10.1016/s2212-5671\(16\)30050-8](https://doi.org/10.1016/s2212-5671(16)30050-8)
- 29) Msaraka, S. S., & Hongzhong, Z. (2015). Economic Growth and Trade Performance in Tanzania. *Developing Country Studies*, 5(18), 141–150.
- 30) Muryani, & Pamungkas, P. A. (2018). The Impact of Unemployment Rate, Labor Force, Capital Inflation Rate, and Government Ecpenditure on Economic Growth in Indonesia. *American Journal of Engineering Research (AJER)*, 7(3), 109–119.
- 31) Nurdiana, Hasan, M., Arisah, N., Riesso, A. S., & Hasanah, D. F. (2020). An Analysis of the Effect of Economic Growth, Inflation, and Open Unemployment on Poverty in South Sulawesi Province. *Quest Journal: Journal of Research in Business and Management*, 8(9), 14–17.
- 32) Okun, A. M. (1962). Potential GNP: Its Measurement and Significance. *Proceeding of the Business and Economics Statistics Section of the American Statistical Association*, 98–103.
- 33) Olusegun, E., & Stober. (2015). The Validity of Okun's Law: An Assessment of United Kingdom's Unemployment-Output Relationship. *International Journal of Economic Practices and Theories*, 5(1), 10–15. www.ijept.org
- 34) Overstreet, D. (2019). The Effect of Minimum Wage on Per Capita Income in Arizona: Empirical Analysis. *Poverty and Public Policy*, 11(1–2), 156–168. <https://doi.org/10.1002/pop4.249>
- 35) Ozcelebi, O., & Ozkan, S. (2017). Economic Factors Influencing the Dynamics of Unemployment in the G10 Countries: Empirical Evidence from Panel Data Modeling. *Journal of Business, Economics and Finance (JBEF)*, 6(1), 17–30. <https://doi.org/10.17261/pressacademia.2017.382>
- 36) Phillips, A. W. (1958). The Relation Between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom, 1861–1957. *Economica*, 25(100), 283–299. <https://doi.org/10.1111/j.1468-0335.1958.tb00003.x>
- 37) Preacher, K. J., & Leonardelli, G. J. (2023). *Calculation for The Sobel Test: An Interactive Calculation Tool for Mediation Tests*. <http://www.quantpsy.org/sobel/sobel.htm>
- 38) Sabir, G. M., & Naz, S. (2015). Economic Determinants of Unemployment: Empirical Result from Pakistan. *Journal of Economics and Sustainable Development*, 6(9), 150–154.
- 39) Singh, D., & Verma, N. (2016). Tradeoff between Inflation and Unemployment in the Short Run: A Case of the Indian Economy. *International Finance and Banking*, 3(1), 77–96. <https://doi.org/10.5296/ibf.v3i1.9378>
- 40) Sumon, K. K., & Miyan, M. S. (2017). Inflation and Economic Growth: An Empirical Evidence of Bangladesh (1986-2016) Khairul. *International Journal of Economics and Financial Issues*, 7(5), 454–464. <http://www.econjournals.com>
- 41) Suparta, I. M., Ujianto, & Murgianto. (2021). Effect of Minimum Wages on Inflation and Unemployment in East Java - Indonesia. *Journal of Economics and Sustainable Development*, 12(8), 18–23. <https://doi.org/10.7176/JESD/12-8-04>
- 42) Thayaparan, A. (2014). Impact of Inflation and Economic Growth on Unemployment in Sri Lanka: A Study of Time Series Analysis. *Global Journal of Management and Business Research: B Economics and Commerce Volume*, 13(5), 44–54.
- 43) Umaru, A., Donga, M., & Hayatudeen, S. Z. (2014). The Growth Effect of Unemployed Resources and Inflation in Nigeria. *Journal of Economics and Sustainable Development*, 5(2), 108–122. www.iiste.org

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- 44) Ume, K. E., Okechukwu, O., O, M. R., & Izuchukwu, O. (2016). Modelling the Long Run Relationship Between Inflation and Economic Growth Using The Engel And Granger Approach (Evidence From Nigeria 1985 to 2013). *IOSR Journal Of Humanities And Social Science (IOSR-JHSS)*, 21(4), 84–90. <https://doi.org/10.9790/0837-2104048490>
- 45) Welch, P. J., & Welch, G. F. (2010). *Economics: Theory & Practice* (9th Editio). John Wiley & Sons. <https://books.google.co.id/books?id=O5i-d3thv-4C&pg=PA146&lpg=PA146&dq=four+macroeconomic+sectors+%22households%22+%22businesses%22+%22government%22+%22foreign%22&source=bl&ots=DYalEGh7AJ&sig=ACfU3U3U4Z3Gya5HBb9i3TLz1EohyVXDYA&hl=en&sa=>
- 46) Yismaw, T. G. (2019). Effect of Inflation on Economic Growth of Ethiopia. *Journal of Investment and Management*, 8(2), 48–52. <https://doi.org/10.11648/j.jim.20190802.13>



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