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Determinant Factors of Unemployment Level in Indonesia at 2000-2016 Period

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Abstract
This study aim is to prove determinant factors affecting unemployment level in Indonesia. The data is collected from annual report from 2000 to 2016 period. The verification uses econometric analysis of Autovector Regression (VAR). The research results show that unemployment level in Indonesia are affected by inflation in first years of previous period, foreign capital flow in lag period of first and second year, GDP in second year, number of people on both first and second year, and wages for the first and second year. The Grangger causality test shows that unemployment level to wage levels (WGE) is dynamic (reciprocal), while the GDP in UE, UE with POP, UE GDP, are unidirectional. Grangger test for INF with UE is not proved significant.

INTRODUCTION

Unemployment is one main variable to become development focus. The unemployment level has a linear relationship pattern with poverty rate. It means the increase in unemployment level in labor force will be followed by higher poor people in a region. Referring to Constitution 1945 Article 27, every citizen is entitled to a decent living and work; this reflects that unemployment issue is a fundamental problem in history of Indonesia development and related to concept of basic objectives of sustainable development as a pillar of human development (Ridho, 2010).

LITERATURE REVIEW

The scientific studies reveal the unemployment determinants from both micro and macro aspects. This research examines unemployment determinants factors based on macro perspective, based on theory and empirical evidence from existing research.

National Income (GDP)

Theoretically and empirically, the experts agree that GDP is an important factor for unemployment level. Some studies include GDP as a predictor of unemployment levels (Trimurti & Komalasari, 2014; Eita & Ashipala, 2010; Maqbool et al., 2013; Sabir & Naz, 2015). Majority findings indicate GDP has a significant effect on unemployment level, but other studies show different results (Sabir & Naz, 2015) to provide evidence that GDP has insignificantly effect on unemployment level.

Gross Domestic Product (GDP) is defined as the market value of all final goods and services produced within a country during a period. However, GDP does not include the value of all activities outside the market, environmental quality and income distribution. Therefore, GDP per capita as GDP size when compared to number of people in a country is a better tool to show to average population and living standard of citizens (Mankiw, 2006: 5).

Inflation

Economic turmoil will be marked by higher inflation to causes higher price of goods. Sukirno (2006: 328) explains that unemployment and inflation are major economic problems for every society caused by economic, political and social condition. Efforts to avoid various adverse effects are done through economic policies as fiscal policy, monetary policy, and supply-side policies.

Inflation can be grouped based on level and severity to increase price. Moderate Inflation is slow and predictable price increase. We can call it a one-year inflation rate. The goods are relatively stable makes people believe in money. Malignant Inflation (Galloping Inflation) is inflation in double or three digits such as 20, 100, or 200 percent per year. Malignant inflation creates serious disruption to economy. Hyperinflation is a condition when the economy has very severe inflation (Samuelson and Nordhaus, 2005: 312)

Population

The classical economic experts mentioned four factors affecting economic growth, namely: the population, amount of stock of capital goods, land area and natural wealth, and level of technology used. The economic growth depends on many factors, but classical economists are more concerned with effects of population growth on economic growth. For example, area land and natural wealth is fixed in number and level of technology has not changed. This separation is used to analyze how the effect of population growth on level of national

production and income (Anggoro & Soesatyo, 2015).

The general trends of a country's population growth follow geometrical trend, namely two-fold every 30-40 years. At same time, food harvest grows in according to arithmetic.

Minimum wage

Wages and unemployment relates closely. Higher wages will affect the amount of labor supply and demand that will ultimately affect the number of unemployed. Wages can be divided into nominal wages and real wages. Nominal Wages (money) is the amount of money that workers receive from employers as payment for mental and physical energy to work in production process. Meanwhile, Real Wage is the level of workers wage measured from wage ability to buy goods and services needed to meet the workers needs (Sukirno, 2006). Kaufman (2000) explains that main goal to set minimum wage is to meet minimum standards living such worker as health, efficiency and welfare.

Foreign Direct Investment

Foreign Direct Investment (FDI) can be defined as a long-term investment of a company in another country. Foreign Direct Investment (FDI) is one characteristics of a global economic system. Foreign Direct Investment (FDI) is considered more useful for country than investment in corporate equity because equity investment has the potential of capital outflow because this equity investment is short term and can be withdrawn suddenly and cause economic vulnerability.

The FDI inflow has three advantages. First, reducing the risk of capital ownership through diversification investment; Second, Global integration of capital markets to provide the best spread in corporate governance, accounting rules, and legality; and third, Global capital mobility limits the government's ability to create false policies (Feldstein, 2000).

RESEARCH METHODS

This research falls into hypothesis testing category to explains the specific relationships or differences between groups or the independence of two or more factors in one situation (Asep, 2006: 83) This research uses explanatory research methodology (quantitative research) with aim to test the hypothesis to develop a theory.

Data analysis

The Vector Autoregressive (VAR) is used as analysis method. VAR is a simple regression of equation Xt = ItXt-1 + € t where Xt = the vector of stationary time series and € t = vector in white noise time series with covariance matrix Ω.

VAR analysis is an econometric model often used in dynamic and stochastic macroeconomic policy analysis. VAR is an equations system to shows each variable as a linear function of constant and lag values of variable itself, as well as the lag value of another variable in the system. The explanatory variables in VAR include lag values of all non-independent variables in VAR systems. It requires retry identification to achieve equations through interpretation of equations (Ajija, et al., 2011: 165).

Data analysis

Step 1: Stationary Test

Test results show the t values of UE variables is -0.302 at p value of 0.560. It accept h_0, it means that data has not stationary at data level. The test is continued on first difference (D (UE) data to get a statistical t value of -3.17 with probability of receiving H_0 by 0.0038 so that H0 is rejected. Thus the unit root test of stationary UE variable show first data difference.

Other result shows the LnGDP variables is stationary in second difference with t statistics of -2.96 and probability to accept H0 is 0.0062. The INF is stationary at with statistical t value of -3.42 and probability to accept H0 is 0.025. The LnPOP variable is stationary at first difference with t statistic equal to -9,69 and probability to accept is 0.000. Subsequent tests on LnWGE and LnFDI variables are stationary at first difference with a statistical t value for LnWGE of -3.37 and p-value of 0029 while FDI of -4.363 and probability to accept H0 is 0.047. The VAR analysis requires stationary data, if using an analysis of all level data, or one data is stationary at level variables.

Step 2: Determination of Lag length

The likelihood ratio test is used to see the most appropriate lag for a model. This test should be performed on any lags that may be appropriate for the model. The appropriate lag selection criteria can be decided by FPE, AIC, SC, or HQ statistics. A good model can provides smallest residual (error) level. This study found the lag = 2, it is suitable for VAR model lag based on all the criteria.

Step 3: Granger Causality Analysis

It is used to know the bias of endogenous variable treated as an exogenous variable.

1. Dynamic Relationship of Unemployment (UE) and Inflation (INF)

Grangger Causality test results show a) unemployment does not affect inflation in Indonesia and b) inflation capability (INF) does not affect inflation in Indonesia. These means that inflation does not cause an increase or decrease in unemployment in Indonesia.

2. Dynamic Relationship of Unemployment (UE) and Foreign Direct Investment (LnFDI)

Grangger Causality analysis result shows unemployment level does not affect FDI in Indonesia. It can be decided statistically that UE cannot cause the FDI inflow into Indonesia.

3. Dynamic Relationship of Unemployment (UE) and Gross Domestic Product (GDP)

Grangger Causality analysis result shows unemployment level affects GDP in Indonesia. It can be decided statistically that UE is a major determinant of GDP in Indonesia.

4. Dynamic Relationship of Unemployment (UE) and Total Population (LnPOP)

Grangger Causality analysis result shows unemployment level affects the population in Indonesia. This means unemployment level causes the population increase in Indonesia.

5. Dynamic Relationship of Unemployment (UE) and Regional Minimum Wage Level (LnWGE).

Grangger Causality analysis result shows unemployment level affects the Regional Minimum Wage (WGE) rate in Indonesia. This means that unemployment level can change the regional minimum wage in Indonesia.

The relationship of regional minimum wage and unemployment level showed a real effect. The F value of statistic is 13.258 with a probability of 0.003 < 0.05, the H0 is rejected. The Regional Minimum Wage is an important determinant to unemployment in Indonesia. The relationship between the two variables shows the existence of causal dynamic relationships. This means that UE can affect WGE, or vice versa.

Step 4: VAR analysis

VAR Equation Model for Independent Variables

Unemployment level (UE)

Prediktor	B	SE	t
D(UE(-1))	-1.668	-0.452	**-3.692**
D(UE(-2))	-0.661	-0.319	**-2.074**
INF(-1)	0.158	-0.065	**2.420**
INF(-2)	0.028	-0.090	0.314
D(LN_FDI(-1))	-3.542	-0.675	**-5.249**
D(LN_FDI(-2))	0.669	-0.214	**3.129**
D(LN_GDP(-1))	-2.618	-4.536	-0.577
D(LN_GDP(-2))	-16.282	-5.798	**-2.808**
D(LN_POP(-1))	-109.104	-34.471	**-3.165**
D(LN_POP(-2))	-53.446	-15.253	**-3.503**
D(LN_WGE(-1))	-15.921	-6.562	**-2.426**
D(LN_WGE(-2))	11.140	-2.112	**5.273**
C	3.560	-1.141	**3.121**
R-squared	0.995		
Adj. R-squared	0.933		
Sum sq. Resids	0.022		
S.E. equation	0.149		
F-statistic	16.180		

Description: The t statistics with bold shows a significant effect because greater than the critical t of 1.96

The above model explains that a 1-year unemployment level increase will have implications to reduce the current unemployment level by 1.668 and vice versa. For last two years period will have effect on current unemployment of 0.661 with negative slope. On contrary, effect inflation increase in one year ago will push the current unemployment level equal to 0.158 and vice versa. The decrease of inflation affect on unemployment level decrease with the change equal to coefficient value.

The effect of FDI on unemployment also for two periods, one and two years earlier. The increase in direct foreign capital inflows in past year will affect on lower unemployment level of 3.542, while FDI flows for two years has unidirectional effect.

GDP, POP and WGE variables show a negative effect. It means each increase in the variable gives a reduction effect on unemployment level, and vice versa. The magnitude of GDP coefficient (for 2 previous years) is **16.282,** while the POP for previous year is 109.104, and second year is 53.446. The effect of wages differs for first year prior second year. The first year shows negative direction with coefficient of 15.90 and for second year of 11.139.

The above model consisting of 4 predictors (INF, GDP, FDI, POP and WGE) with a lag length of 1 to 2 years. These can explain the change of unemployment level in Indonesia at 93.3% with model fit test based on F statistic of 16.180. It means the model is right predictor for unemployment level in Indonesia.

Impulse Analysis and Decomposition of Unemployment level in Indonesia

The innovation gives 1 standard deviation on inflation. It affect to increase unemployment by 0.5 in first 2 years, then the response of unemployment level decreases on until the 6th period. The innovation effect begins to stabilize in next 9th years, as shown in figure below.

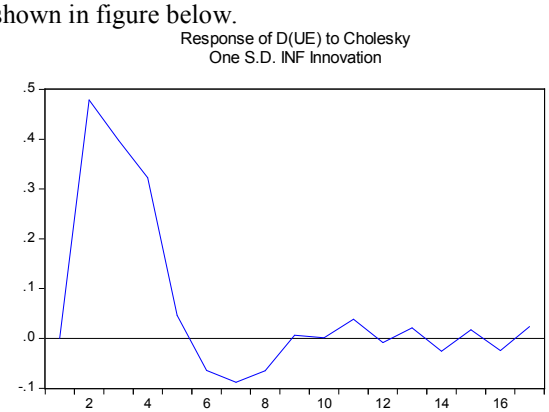

Figure 1. UE Response to INF's Shocking Impulse

The UE response on FDI level shows shocks in first to second year, with UE increase, but decreased in third year. In year 4, the effect of FDI is stable and the shock effect disappears, as shown in figure below.

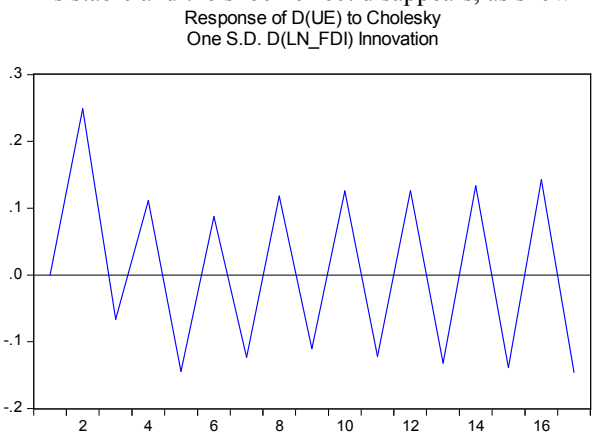

Figure 2. UE Response to FDI Shocking Impulses

Same as with FDI, GDP shows a short effect. GDP variable decreases unemployment level to 1.0 standard deviation. In 3rd year of 17th year show positive and negative the effects with higher deviation, as shown in figure below.

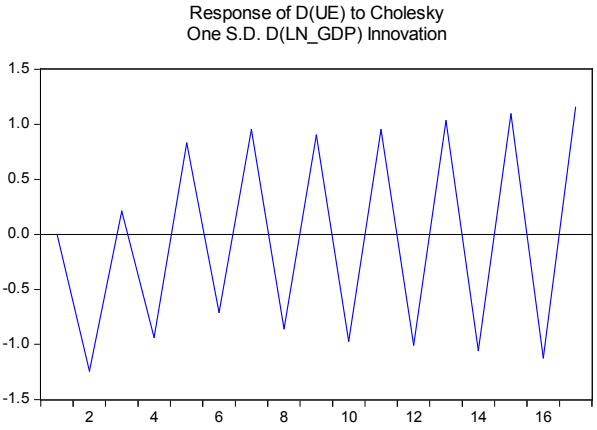

Figure 3. UE Response to GDP Impulse Shocking

The UE response to population variable also shows insignificant shocks. Although the effects of change are high but the fluctuations shown within same range during the 3rd to 17th year, as shown in figure below.

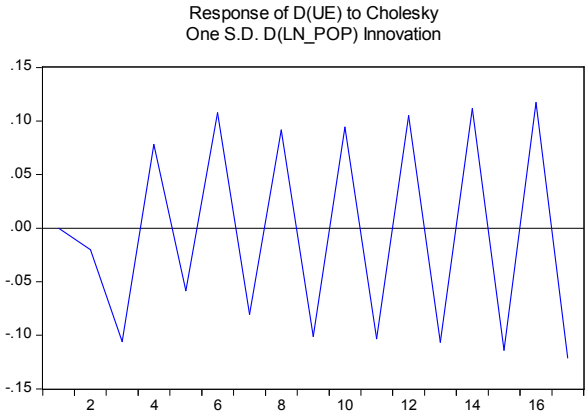

Figure 4. UE Response to POP Shocking Impulse

The wage affects to increase 1 standard deviation. It shows a positive response to unemployment level, although the increase only 0.06. The shock effect is only up to 3rd year while in 4th year the effects shows consistent fluctuations. This suggests that effects of wages on unemployment is short-term.

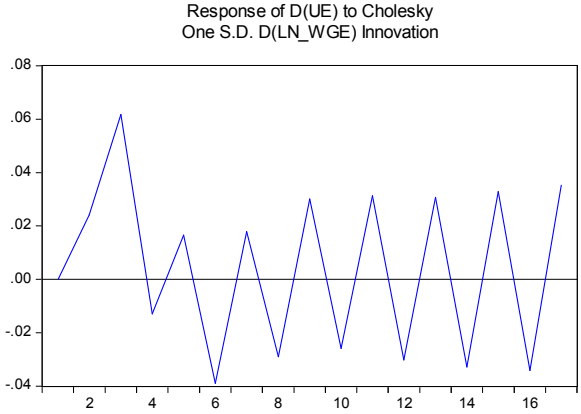

Figure 5. UE Response to WGE Shocking Impulses

The model decomposition shows that in first year the change from 100% unemployment level is caused by the changes in unemployment level in first period. In second period, UE contribution composition fell 26.9% while the GDP contribution increase from 0% to 61.3%. In second year, role of inflation increase from 0 to 9% and continue increase to 14% in third year. In fourth year, contribution of inflation decreased to 12% and decline to 5% in tenth period. GDP continue to rise to **75% in first to tenth period**. The contribution of FDI increases in second period, and moved in range of 2.4% to 1.75% between the second periods until the tenth period. While the contribution to wages and population is very small under 1% for 10 years.

DISCUSSION

The Relationship of Minimum Wage and Unemployment

The result of causality relationship analysis shows that unemployment level in Indonesia has dynamic relationship with regional minimum wage rate. This indicates that a shock in unemployment level, both increase or decrease, will be responded in next period in form of regional minimum wage change. Likewise, changes in wage rates can have an effect on unemployment level.

The VAR coefficient model shows that regional minimum wage in first year's lag has a negative effect on unemployment level with coefficient of -15.921. This means that higher minimum wage in first year will be responded to lower unemployment. However, these results are not consistently negative, because at second year lag, the effect is positive. This indicates that a continuous increase in regional minimum wage may increase unemployment.

This finding is consistent with empirical evidence of Panjawa & Soebagiyo (2014) to examine the effect of minimum wages increase on unemployment levels, that minimum wages have a positive effect on unemployment level. This finding is also consistent with Trimurti & Komalasari (2014) that minimum wage rate is the main determinant of unemployment level

Relationship of Foreign Direct Investment and unemployment

The Granger Causality analysis shows that FDI has significant effect on unemployment level. The VAR equation model analysis shows that FDI in first year's lag has a negative effect but in second year has positive effect.

FDI has a positive effect on unemployment (Efendi and Soemantri, 2003). It is supposed that foreign direct investment into a country allows the absorption of expertise in form of technology transfer, managerial skills, introduction of new technologies in production and ability to access the network international. Adversely, as Germidis (1977) said foreign direct investment can disrupt the economy of destination country. Nevertheless, several studies have shown strong evidence the negative effect of FDI on unemployment level (Zeb et al., 2014; Trimurti et al., 2015; Sabir & Naz, 2015). These findings indicate that foreign direct investment has a positive effect on economy in form of employment.

Relationship of GDP and unemployment

The results of causality test show that unemployment level affect on GDP. The Granger test shows that unemployment level affects the domestic income, but the relationship is not dynamic and only applies in same direction. This shows that changes in unemployment level affect on national income, while the VAR equation model shows that GDP in second year (lag 2) has negative effect on unemployment level in Indonesia. Decomposition analysis with GDP treatment indicates that GDP has large contribution from 61% to 75% for second to tenth period. This indicates that GDP variable is an important determinant of unemployment level in Indonesia.

The relationship between GDP and unemployment level is consistent with several studies. The majority of empirical findings indicate an important function of national income to decrease unemployment (Trimurti & Komalasari, 2014; Eita & Ashipala, 2010; Maqbool et al., 2013; Sabir & Naz, 2015).

Relationship of Population and unemployment

The Granger test shows no dynamic relationship between the population and unemployment level in Indonesia. However, test shows the causality relationship between the unemployment level and population. The VAR coefficient explains that population has a negative effect on unemployment level, it means that higher unemployment level in Indonesia can trigger a lower population.

Flaim (1990) states that population change is strongly associated with long-term unemployment, this is because changes in age structure of population can have a significant effect on various labor market indicators.

Relationship of Inflation and unemployment

The increase in inflation last year will increase current unemployment level, and vice versa. This research is consistent with Iqbal and Rahmawati (2012) that inflation rate has a significant effect on unemployment in Surabaya. This study is also consistent with Rovia Nugrahani (2013) that inflation has a positive effect on unemployment.

CONCLUSIONS AND RECOMMENDATIONS

Conclusion

Variables as unemployment determinants level in Indonesia and having causal relationship are wage rate, FDI, GDP and population. Testing the relationship of unemployment level and inflation or vice versa, unemployment level and FDI, GDP and unemployment level, population and unemployment level are not proven to have a significant causality relationship.

The relationship between unemployment level and wage rate is dynamic. The magnitude of unemployment level can become the trigger to changes minimum wage rate or vice versa. Decomposition analysis shows that main contribution of unemployment level is GDP, inflation and FDI.

Suggestion

The higher continuous minimum wage can increase unemployment. Government should be wise to implement Regional Minimum Wage to support company and entrepreneurs interested to invest in Indonesia.

Long-term foreign investment will reduce unemployment. Government should create a favorable business climate, improve domestic security, and improve infrastructure development

Long-term, GDP negatively affects on unemployment. Government in long run should implement a standard tax policy.

The increase in unemployment level will decrease the population. Government should be wise to set wages, and population policies through family planning programs.

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