

---

**DO TRADE-OFF INFLATION AND UNEMPLOYMENT HAPPEN IN INDONESIA?**

Erni Panca Kurniasih<sup>1</sup>, Metasari Kartika<sup>2</sup>

<sup>1</sup>Universitas Tanjungpura, Faculty of Economics and Business,

Jl.Prof.Dr.H.Hadari Nawawi, Pontianak

<sup>2</sup> Tanjungpura University, Faculty of Economics and Business,

Jl.Prof.Dr.H.Hadari Nawawi, Pontianak

**Abstract**

This study aims to analyze the relationship between inflation and unemployment in Indonesia. This study tries to reexamine whether the Phillips theory, which states the trade-off between inflation and unemployment, occurred in Indonesia over the past 30 years (1988-2017). Data were analyzed using an error correction model (ECM) to see the short-term and long-term relationship between inflation and unemployment. The study found that in the short term, unemployment has a positive effect on inflation but is not significant, meaning there is no trade-off between unemployment and inflation in Indonesia. But in the long run, unemployment has a negative and significant effect on inflation, meaning there is a trade-off between unemployment and inflation where if unemployment increases, the consequences will reduce the rate of inflation and vice versa if unemployment falls, inflation will increase.

**Keywords:** inflation, unemployment, Phillips curve, trade-off .

**1- INTRODUCTION**

Inflation and unemployment are two things that need to be controlled in the economy and should be kept in a low level. Targets to lower the inflation rate and unemployment are often cannot be reached simultaneously because tradeoffs always arise between those two, especially in short-term. There is an inverse relationship between unemployment and inflation in short-term which means, if the unemployment level is high, the inflation rate will be low and vice versa. (Umaru & Zubairu, 2012).

Every country will make an effort to keep the inflation and unemployment level low because it will bring macroeconomic stability in the country. This stability is important to reach the effective economic growth and development (Orji, Orji-Anthony, & Okafor, 2015). When the money supply increases it will cause the high price of goods and services (inflation). Phillip's curve explains that in short-term, there is no relationship between inflation and unemployment (Phillips, 1958) (Friedman, 1968).

Inflation and unemployment are two macroeconomic indicators to see a country's economic stability. That's why these two variables are never obsolete to study. Generally, inflation is defined as the increase of prices in general and continuously. The increase of prices of one or two items alone cannot be defined as inflation unless the increase is widespread (or causes other

price increases) on other items. Inflation can be caused by the demand and supply so the policy approach should consider these aspects. On the demand aspect, inflation control should be done to maintain people's purchasing power and on the supply aspect, inflation control is needed so the production cost remains under control and the businesses can survive and compete. If the inflation is out of control, it will cause the business actors to cut their employees which will further cause unemployment increase.

The inflation increase depicts the price instability in a country (Zaman et al., 2011). According to Nazar et.al (2010), controlled inflation would not harm the economy but inflation uncertainty could damage the economy. The high inflation is a macroeconomic problem that needs to be solved by monetary authority (Duasa and Nursilah, 2009). Through monetary policy, the price stability will be maintained and the unemployment and inflation will remain controlled (Liu and Rudebusch, 2010; Puzon, 2009). Furuoka (2007) found that there is long-term relationship and tradeoffs between inflation and unemployment in Malaysia they also found that there is relationship between unemployment level and inflation rate in Malaysia. Study conducted by Karanassou and Sala (2010) proved that there was tradeoffs in long-term inflation-unemployment in United States. The monetary authority emphasizes on the inflation response or unemployment on the money growth shocks.

Historically, the rate and volatility inflation in Indonesia are higher than other developing countries. While other developing countries' inflation rate was between 3-5 percents per year in 2005-2014, Indonesia's average annual inflation rate was around 8.5 percents for the same period. Since 2015, the inflation in Indonesia is considered controlled. The cutting of fuel subsidies at the end of 2014 had pushed the inflation rate to 1.50 percent and 2.46 percent in November and December 2014, respectively.

Furuoka & Munir (2014) Al-Zeaud (2014) Relationship between unemployment and inflation has often been discussed especially those related to Phillip's curve which stated there is negative relationship or tradeoff between unemployment and inflation. The validity of this hypothesis has been studied by Furuoka & Munir (2014) in Malaysia, but a study by Al-Zeaud (2014) in Yordania concluded that there is no causality between those two and Phillip's curve did not apply in Russia (Alisa, 2015).

The inflation rate in long-term is also affected by unemployment. The low unemployment level indicates that there are many workforces are used so people's purchasing power increases and ultimately encourages demand. An increase of demand without the increase of supply will lead to price increases (inflation). Indonesia's success in increasing employment chances in certain sectors such as the industrial and service sectors eventually reduced the national unemployment rate but the agricultural sector continued to decline at only 29,46% of the total working population up until February 2019. When the agricultural sector rapidly grows it can absorb workforces in significant number, but when it experiences a setback, its ability to absorb workforces is low. In 2019, the total workforce in the agricultural sector was only 38.11 million people, which decreases by 590 thousand people compared to the previous year.



Source: Samuelson dan Nordhaus (2004)

**Figure 1: Philips' Curve**

Phillips' curve shows a trade-off between inflation and unemployment. A. W. Phillips illustrates that the inflation is a reflection of an increase of aggregate demand. This increase will lead to the increase of prices and encourage the suppliers to increase their productions by adding workforces, decreasing unemployment. This study will re-prove whether the trade-off between inflation and unemployment occurs in Indonesia.

## 2- LITERATURE REVIEW

Phillips found a consistent negative relationship between unemployment and the wage changes rate. Wage reduction is associated with high unemployment rates while wage increase is associated with low unemployment rates. Changes in wage are linked to the changes in prices of goods and services as well as the increases in rates (Phillips, 1958) (Friedman, 1976). A study about inflation and unemployment conducted in European Union in 1998-2007 found that there was a negative relationship between inflation and unemployment (Popovic & Popovic, 2009).

Inflation stability is necessary, but stabilization without recession is quite impossible (Kamin & Klau, 1998). Inflation is known as a situation in the economy when the money supply grows faster than the goods and services productions in the same economy (Hamilton, 2001). Furthermore, inflation is defined as the increase of general prices of goods and service in certain period of time, especially a long one (Balami, 2006). Granger's analysis concluded that the money supply causes the output and inflation; therefore, monetary policy plays an important role in price stability in Nigeria's economy (Omoke & Ugwuanyi, 2010).

The main source of inflation and unemployment are fiscal and monetary policies and balance of payments. An increase in the money supply causes the inflation of monetary policy. The inflation of fiscal policy tightly relates to the money issuance because it will be mostly used to finance the government's deficit. Further, in the balance of payment aspect, the high exchange rate is very important. This is because the increase of exchange rate causes an increase in import price and it will eventually increase the inflation expectation (Umaru, Donga, & Musa, 2013).

A study by Furuoka & Munir (2014) aims to empirically analyze the relationship between unemployment level and inflation rate in developing country. This study used error correction models (ECM) approach which analyzed Malaysia data for 30 years (1975-2004). The study found that there was relationship between unemployment level and inflation rate in Malaysia. In other words, this study finding supported the validity of Phillips' Curve hypothesis.

Al-Zeaud (2014) investigated a trade-off relationship between unemployment and inflation in Jordanian's economy for 28 years between 1984 and 2011. The data were analyzed using Granger causality. Study finding showed that there was no causality between unemployment and inflation in Jordan in the period of research, which means there is no trade-off between two variables. This study recommends the policy makers to consider this finding in solving unemployment problem and encourage them to create a program to reduce unemployment rate through productive and intensive project creations, replace foreign work labors with local work labors while keep controlling inflation to ensure Jordan to reach the expected unemployment and inflation rate, which will eventually grows the economy.

Alisa (2015) reviewed the relationship between inflation and unemployment in Russia using two time approach, which were long-term (17 years time period from 1999 to 2015) and short-term (January to December 2014). Study findings concluded that a certain inflation and unemployment rate was needed to balance the market and Phillips' Curve did not really apply in modern Russia situation. Meanwhile, a study by Ningsih (2010) found that there was no effect of inflation on unemployment rate in Indonesia.

The increase of inflation depicts the price instability of a country (Zaman et al., 2011). According to Nazar et.al (2010), controlled inflation should not harm the economy but the inflation uncertainty may instead damage the economy. The high inflation is a macroeconomic problem that needs to be solved with monetary authorities. (Duasa dan Nursilah, 2009). Through monetary authorities, the price stability can be maintained so the unemployment and inflation remain controlled (Liu and Rudebusch, 2010; Puzon, 2009). Furuoka (2007) found a long-term relationship and a trade-off between inflation and unemployment in Malaysia and also found a relationship between unemployment rate and inflation rate in Malaysia. A study by Karanassou and Sala (2010) proved that there was trade-off of inflation-unemployment in long-term period in United States. Monetary authorities emphasize on the inflation or unemployment response on the money growth shocks.

### 3- METHODOLOGY

Data analysis method used in this study was error correction model (ECM) analysis. ECM is a short-term balance that requires a co-integration between variables. The short-term estimation was done ahead of the long-term estimation. The Error Correction Model (ECM) was specified in a long-term formulation using this equation:

$$Lif = \beta_0 + \beta_1 Lpg + \varepsilon_i \quad (1)$$

and the short-term relationship formulation was stated using this equation:

$$DLif_t = \beta_0 + \beta_1 DLpg_t + \beta_2 BLpg_t + \beta_3 ECT \quad (2)$$

in which:

$\pi$  = inflation

$u$  = unemployment

$B$  = operation lag

$D$  = changes

$DLif$  =  $Lif - BLif$

$DLpg$  =  $Lpg - BLpg$

$BLpg$  =  $Lpg - Lpg_{-1}$

$ECT$  =  $Lpg_{-1} - Lif_{-1}$

$\beta_1, \beta_2$  = coefficient

$\varepsilon_i$  = error component in an unobservable individual specific effect

#### 4- RESULTS AND DISCUSSION

Before the regression test was conducted using ECM test, we needed to find out whether the variables used were stationary. Therefore, the first step of the test was conducted to examine all variables using unit root tests and the result was all variables were stationary in the first difference. Because all variables were stationary, a co-integration test (Johansen) was done to see whether the variables had long-term relationship. Co-integration test findings showed in table 1.

Co-integrated variables or variables that have long-term relationship was seen if trace statistic > critical value and max-eigen statistic value > critical value. According to table 1, it can be seen that trace statistic value was 26.11679 > 25.87211 and max-eigen value was 22.99713 > 19.38704. It means that variables observed in this study have long-term relationship or are co-integrated. Later, an error correction method was conducted to give further information about the short-term and long-term relationship of the data observed.

Error Correction Model (ECM) test was done to see if the independent variable affect the dependent variable in short-term. According to the previous test, the variables were stationary in the first difference and those variables were co-integrated. A short-term ECM estimation was then done with the equation as follows:

$$Dif_t = 2.383275 + 1.146972DLpg_t - 1.230298BLpg_t + 1.209479ECT \quad (3)$$

Prob	0,1819	0,0011
0,0000		

**Table 1 : Co-integration Test Result**

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.547517	26.11679	25.87211	0.0466
At most 1	0.101990	3.119660	12.51798	0.8620
Trace test indicates 1 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.547517	22.99713	19.38704	0.0143
At most 1	0.101990	3.119660	12.51798	0.8620
Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Calculation using short-term ECM analysis resulted in the ECT variable value, in which the ECT was used as an indicator whether the model specification was considered valuable, seen from its significance and coefficient from the error correction. Based on the linear function regression of short-term ECM result, we found that the ECT (Error Correction Term) coefficient value was 1.209479. This finding showed that the proportion of imbalance cost in inflation progress on the unemployment in previous period in accordance with the current period which was around 1.209479%. From its significance findings, ECT showed 0.0000 values and was significant in 5% level. This means the model specification was valid and indicated possible short and long term relationship. Based on the estimation above, the short-term constant value was 2.383275 which meant the change of unemployment because of inflation was 2.383275% assumed that all explanatory variables were zero.

The short-term ECM result showed that unemployment variable had positive and insignificant effect on inflation rate. In short-term, unemployment coefficient variable was 1.146972 with probability value of 0.1819 which meant it was insignificant in significance level of 5%. After finding short-term ECM estimation, the long-term coefficient was then being calculated. According to Widarjono (2009), the equation to find long-term coefficient can be stated as follows:

$$\text{Constanta} = (\beta_0 / \beta_3)$$

$$\text{BLpg} = (\beta_2 + \beta_3) / \beta_3$$

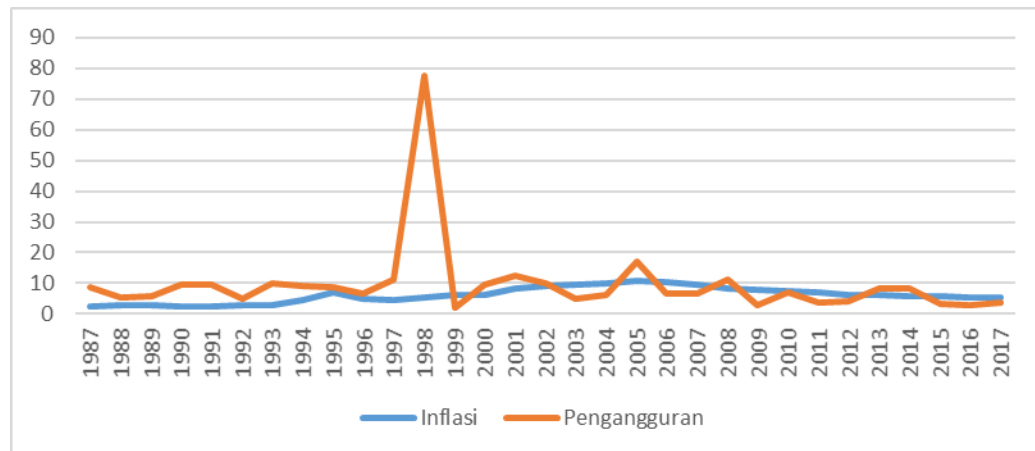
The long-term ECM regression result was:

$$\text{DLif}_t = 1,9704 - 0,0172\text{BLpg} + 1.209479\text{ECT} \quad (4)$$

Prob	0,0007	0,0011
------	--------	--------

From the equation (3) and (4) we found out that in short-term, the relationship between unemployment and inflation was positive but insignificant, which means in short-term there will be no trade-off between unemployment and inflation in Indonesia. However, in long-term, the relationship between those two variables was negative and significant which means in long-term there will be trade-off between unemployment and inflation. If the unemployment increases the inflation will decrease and vice versa; if the unemployment decreases the inflation will increase.

These findings support the Phillips' Curve and studies about the developments of unemployment and inflation variables in developing countries and in the Asian continent. This study is in line with Furuoka & Munir (2014) findings in Malaysia, but a study by Al-zeaud (2014) in Jordan concluded there was no causality between these two variables and Phillips' Curve does not apply in Russia (Alisa, 2015).



**Figure 2: Trend of Inflation and Unemployment in Indonesia (Data source: Bank Indonesia)**

The unstable inflation rate in Indonesia can be caused by, one among others, unstable food prices (prone to weather condition) and this causes a heavy burden on households that are below or slightly above the poverty line. Why? Because these households spend more than half of their income on food, especially rice.

**Table 2: Annual Inflation Categorized by Group (%)**

No	Indicators	2014	2015	2016	2017
1	Groceries	10,57	4,93	5,69	1,26
2	Fast food, beverages, cigarettes, and tobacco	8,11	6,42	5,38	4,10
3	Housing, water, electricity, gas and fuel	7,36	3,34	1,90	5,14
4	Clothing	3,08	3,43	3,05	3,92
5	Health	5,71	5,32	3,92	2,99
6	Education, entertainment, and sport	4,44	3,97	2,73	3,33
7	Transportation, communication, and financial services	12,40	-1,52	-0,72	4,23

Source: Central Bureau of Statistics

In the short-term unemployment, which cause people do not have income, will not immediately reduce their consumption, but in the long run they will hold their spending given the limited income. Therefore, the high rate of unemployment will cause low inflation because of the limited demands. The low unemployment rate means many people have income, increasing the purchasing power and causing the demands to keep increasing. The high demand leads to the increase of good and service prices up until the supply cannot even meet the demand anymore.



On the contrary, the high unemployment rate causes the decrease of purchasing power and the demand for goods/services is not high and can be fulfilled by the supplier so the inflation is low.

Although Indonesia has experienced a strong macroeconomic growth since 2000, these informal sectors –both in cities and villages– until now still plays a big role in Indonesian economy. Although it is difficult to determine the exact amount, it is estimated around 55 to 65% jobs in Indonesia is informal jobs. Up until now, around 80% of the informal jobs are concentrated in rural areas, mainly in construction and agricultural sectors. Working in informal jobs has certain risk because the informal sector worker usually gave lower and unstable income. Moreover, they do not have access to basic protection and service. Meanwhile, the money flow in the informal sector is not taxed and informal activities are not included in the gross national product (GNP) or gross domestic product (GDP) calculations.

The low employment of Indonesian labors is closely related to several alarming economy sectors. One of sectors that need special attention is agriculture. According to data from Central Bureau of Statistics (BPS in Indonesia), agriculture is a sector that absorbs the most work labors, which is 29,46% from total working population per February 2019. This means, if the sector develops well, the employment will be higher. If the sector which absorbs the most workers did not develop well, the employment could not be optimal too. This is proven in February 2019 when the total workforce in the agricultural sector was only 38,11 million people, decreased by 590 thousand people compared to the previous year (February 2018).

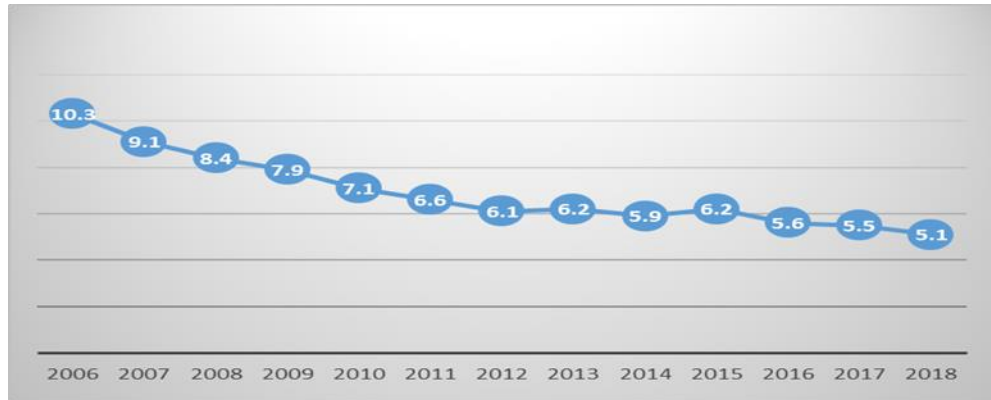
The latest data from the Central Bureau of Statistics (BPS) shows the economic growth in manufacturing industry sector has continued to slow down. In the second quarter of 2019, the growth rate was only 3.54% year-on-year (YoY). It was the smallest since the second quarter of 2017 (two years ago) and has slowed down for three consecutive quarters As a result, the Indonesian manufacturing industry to Gross Domestic Product (GDP) in the second quarter of 2019 was only 19.52%, which means the trend continues to weaken.

Compared to our several neighboring countries, such as Malaysia, Thailand and Vietnam, in the 2014-2018 Indonesia's manufacturing performance was the worst, decreasing by 1.21 percents from 21.07% to 19.86%. In Malaysia and Thailand, the manufacturing sector in GDP also fell in the same period, but at a slower pace, which were 0.92 and 0.82 percents, respectively.

Macroeconomic growth that has been strong for more than a decade has gradually been able to reduce unemployment in Indonesia. However, with an estimated two million Indonesians entering the workforce each year, it is a huge challenge for the Indonesian government to stimulate the creation of new employment opportunities so that the labor market can absorb job seekers which continue to grow each year; young unemployed (mostly those who have just graduated from college) are one of the main concerns and need quick action.

The strong macroeconomic growth in more than a decade has gradually reduced the unemployment in Indonesia. However, with an estimated two million Indonesian entering the productive age each year, it is a huge challenge for the Indonesian government to encourage new employment to absorb more the job seekers that keep growing each year; young unemployed

people (mostly those who just graduated from college) are one of our main concerns and we need quick action to solve this problem.



Source: Central Bureau of Statistics

**Figure 3: Unemployment in Indonesia**

When we look at the unemployment in urban and rural areas in Indonesia, we will see the gap between those has been widened over the past four years because unemployment in rural areas has fallen faster than that in urban areas due to large numbers of rural workers moving to urban areas to seek job opportunities.

The rapid urban development in Indonesia accompanied by industrialization has caused Indonesia to be a middle-income country. On the other hand, this process needs to be followed by the job creation and strengthening Indonesia human resources through improving the education quality and health service.

## 5- CONCLUSION

In the short-term the relationship between unemployment is positive but insignificant which means in short-term there will be not trade-off between unemployment and inflation in Indonesia. However, in the long run the relationship between unemployment and inflation is negative and significant. This means there is a trade-off between unemployment and inflation. When unemployment increases, the inflation will fall and conversely, when unemployment decreases, the inflation will rise.

This study recommends the unemployment problem should be solved in short term through the intensive and productive job creation to reduce unemployment in Indonesia. Besides, the foreign workers must be replaced by local workers to improve local economy. If unemployment is successfully reduced it will have broad impact on economic growth and can also benefit to control inflation.

**6- REFERENCES**

- [1] Alisa, M. (2015). The Relationship between Inflation and Unemployment : A Theoretical Discussion about the Philips Curve. *Journal of International Business and Economics*, 3(2), 89–97. <https://doi.org/10.15640/jibe.v3n2a7>
- [2] Al-zeaud, H. A. (2014). The Trade-Off between Unemployment and Inflation Evidence from Causality Test for Jordan. *International Journal of Humanities and Social Science*, 4(4), 103–111.
- [3] Balami, G. (2006). Innovation and Growth in Developing Countries. *Journal of Development Economics*, July; Growth in Developing Countries, *Journal of Economic Literature*, September: Growth in the Global Economy. Cambridge, Mass: MIT Press, 33(3) .
- [4] Creswell, J. W. (2016). *Research Design Pendekatan Metode Kualitatif, Kuantitatif, dan Campuran (Edisi Keem)*. Yogyakarta: Pustaka Pelajar.
- [5] Duasa, J. & Ahmad, N. (2009). Identifying good inflation forecaster. MPRA Paper No. 13302. Retrieved from <http://mpa.ub.uni-muenchen.de/13302/>.
- [6] Fatmi Ratna Ningsih. (2010). Pengaruh Inflasi dan Pertumbuhan Ekonomi terhadap Pengangguran di Indonesia periode tahun 1988-2008.
- [7] Friedman, M. (1976). Inflation and Unemployment. *Chicago Journals - Journal of Political Economy* , 451 - 472.
- [8] Furuoka, F. (2007). Does the Phillips curve really exist? New empirical evidence from Malaysia. *Economics Bulletin*, 5(16), 1-14
- [9] Furuoka, F., & Munir, Q. (2014). Unemployment and Inflation in Malaysia : Evidence from Error Correction Model. *Malaysian Journal of Business and Economics*, 1(1), 35–45.
- [10] Hamilton, A. (2001). Exploding Inflation. Zea; Intelligence . Kamin, S., & Klau, M. (1998). Some Multi-Country Evidence on the Effects of real Exchange Rates on Output. *International Finance Discussion Papers*, Washington,D.C: Federal Reserve Board, 611
- [11] Karanassou, M. & Sala, H. (2010). The US inflation – unemployment trade-off revisited: New evidence for policy-making. *Journal of Policy Modeling*, 32, 758-777.
- [12] Liu, Z. & Rudebusch, G. (2010). Inflation: Mind the gap. *FRBSF Economic Letter* 2010-02, January 19.
- [13] Orji, A., Orji-Anthony, I., & Okafor, J. (2015). Inflation and Unemployment Nexus in Nigeria: Another test of the Phillip's Curve. . *Asian Economic and Financial Review* . Phillips, W. (1958). The Relationship between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom. *Economica*
- [14] Phillips, A. W. (1958). The Relationship between Unemployment and the Rate of Change of Money Wage in the United Kingdom, 1861-1957, *Economica*, 25 (100): 283-299.
- [15] Popovic, G., & Popovic, J. (2009). Inflation and Unemployment in the EU: Comparative Analysis of Phillips Regularity. UDK 336.748.12,331.56. *Dyanamics in Nigeria: Is there*

Evidence of Jobless Growth? Paper presented at the 53rd Annual Conference of the Nigerian Economic Society (NES) on "Youth Employment and Poverty Reduction in Nigeria", Abuja.

- [16] Puzon, K. A. M. (2009). The inflation dynamics of the ASEAN-4: A case study of the Phillips curve relationship. Marsland Press, Journal of American Science, 5(1), 55-57
- [17] Tang, C. F. & Lean, H. H. (2007). The stability of Phillips curve in Malaysia. Discussion Paper 39, Monash University, Business and Economics
- [18] Todorova, T. (2012). The Economic Dynamics of Inflation and Unemployment. Theoretical Economics Letters, 2(May), 133–140.
- [19] Umaru, A., & Zubairu, A. (2012). An Empirical Analysis of the Relationship between Unemployment and inflation in Nigeria from 1977-2009. Economics and Finance Review Vol.1
- [20] Umaru, A., Donga, M., & Musa, S. (2013). An Empirical Investigation into the Effect of Unemployment and Inflation on Economic Growth in Nigeria. Interdisciplinary Journal of Research in Business, Vol.2, Issue. 12 (pp.01-14)
- [21] Zaman, K., Khan, M. M., Ahmad, M. & Ikram, W. (2011). Inflation, unemployment and the NAIRU in Pakistan (1975-2009). International Journal of Economics and Finance, 3(1), 245-254.