An Investigation of joint significance of economic growth and inflation rate on unemployment rate in Tanzania

Rashid Suleman*

Department of Accountancy and Finance
Institute of Accountancy Arusha
Rashidsuleman56@gmail.com

Valensi Kagoro

Department of Accountancy and Finance
Institute of Accountancy Arusha
Vkagoro77@gmail.com

* Corresponding author

Abstract

This study aims at investigating the joint significance of economic growth and inflation rate on unemployment rate in Tanzania using time series data for the period of 1990-2021. Quantitative research approach was used. The study used only secondary data to achieve its main objective. In data analysis, the researcher employed Dynamic Ordinary Least Square (OLS) method as a basis of estimation because of its superiority in taking care of simultaneity and small sample bias. To ensure reliability result of the study and hence validity, the researcher applied different test in solving the problem such as using ADF and PP test for unit root. Moreover, through obtaining data from approved credible source, the researcher ensured validity of data and information as well as reliability of data. The researcher observed all ethical issues throughout the study. The findings of this study revealed that gross domestic product (GDP) and inflation rate have effects to unemployment rate in Tanzania. The regression output model showed that inflation has a positive effect to unemployment rate while gross domestic product has a negative effect to unemployment rate in Tanzania. The recommendations made in this study include, Policy makers need to use monetary policy instruments in boosting up the economic growth while maintaining inflation rate at a very moderate level as high inflation rate is the sign of economic instabilities, and efforts should be made by the policymakers in Tanzania to increase the level of output in the economy by enhancing on productivity in order to reduce unemployment rate.

Keywords: Economic growth, Inflation rate and Unemployment rate.

1. Introduction

An employment is one of the most important part of the economic, social and environmental development process and progress of any country (Bohlmann, et al., 2019). According to Hashim (2016), employment provides financial freedom and decision-making power in the society. It is important for a country to absorb most of the existing labor force to boost the economy.

Economically, employment provides income to poor families, revives domestic demand for goods and services, and stimulates overall growth. Socially, employment can also promote social healing, encourage the return of displaced persons, and improve social welfare in the long run.

On the other hand, Wu, et al. (2021) pointed out that unemployed workforce in the particular country is

wastage of the existing opportunities that the economy holds. High level of employment in any country is crucial as it helps keeping citizens away from involvement of unlawful activities like robbery, theft and prostitution. Sector of employment is an important indicator in the labor Market; it shows the sectoral ability to create jobs in an economy. In many countries, the private sector has been the main driver of the economy as well as employment. Results of the projected share of sectoral employment indicates that, private sector (including agriculture) has been the main driver of the Tanzanian economy with a proportion of 96.5% of total employment in 2014 with a relative same share of employment in 2018, which is about 95.7%.

Unemployment rate is the best-known labor market measure and is one of the most widely quoted by media in many countries (Bohlmann, et al., 2019). According to the International Labor Organization, (2017), unemployment is defined as a situation whereby people who are of course adults with the age of 16 or above who are willing and able to work at an existing wage rate cannot find a job Unemployment rate is a useful measure of underutilization of the labor supply. It reflects the inability of an economy to generate employment for those persons who want to work but are not doing so, even though they are available for employment and actively seeking work. It is thus seen as an indicator of the efficiency and effectiveness of an economy to absorb its labor force and the performance of the labor market.

Worldwide, several studies about the impacts of economic growth and inflation rate on unemployment rate have been conducted. For instance, Manzoor, et al. (2019) in Pakistan reported that there is a relationship between economic growth and inflation rate on unemployment. It was further noted that when the economies grow, the unemployment rate decreases. Moreover, a study by Iwasaki, et al. (2021) in Japan, UK and the US found that during the recovery from the global financial crisis, most advanced economies have experienced a surprisingly weak response of wage inflation to the decline in unemployment. Therefore, high inflation rates may result to unemployment.

In Africa, as indicated by Baah-Boateng (2016), the employment rate has remained at a lower rate and many people who are not officially unemployed are however engaged in vulnerable occupations, subsistence jobs or informal sector. The challenge is that a large share of the population has engaged in informal sector and therefore they are not appearing in the labor force. For instance, according to the statistics it is seen that about 13% males of the age between 15 to 24 years old are unemployed while 15% females of the age 15 to 24 years are unemployed across the continent.

Actually, Africa as a continent has been facing two twins' challenges which are unemployment and underemployment that strictly worsening general informality in the countries in Africa. Working age population in Africa is growing as projected to increase to almost 1 billion by 2030 from 705 million in 2018. Thus, Africa needs to create almost 12 million new jobs every year in order to prevent unemployment from increasing as reported by Bohlmann, et al. (2019) and African Development Bank Group (2019).

According to United Nations Economic Commission for Africa (2016), Africa continent was also claimed to be the fastest growing population in the world from the year 2000 to 2015 the population increased from 814 million to almost 1.2 billion. United Nations has projected in

medium scenario population to increase to almost 1.7 billion in the year 2030 and almost 2.5 billion in the year 2050. Population at working age which is defined as an age of 15 to 64 years is increasing rapidly compared to the population, this in turn leads to an increase in labor supply hence an increase in labor force. The positive effect of labor supply will materialize only if enough jobs in the economy will be created. Otherwise, the labor force participation rate will fall as people will be discouraged from entering the labor force due to lack of access to jobs opportunity resulting to unemployment. Suleiman, et al. (2017) pointed out that inflation rate is considered to be a crucial macroeconomic determinant, as it determines the purchasing power and cost of living of individuals in a country. Bank of Tanzania (BOT), (2017) reported the global inflation rate base on consumer price index picked up from 2.8% in 2016 to 3.0% in 2017 caused by increase in oil prices around the world. Correspondingly to sub-Saharan Africa showed a double-digit inflation rate of 11.0% in 2017 from 11.3% in 2016 (Bank of Tanzania 2017). Africa economic growth was also acknowledged by the United Nations Economic Commission for Africa (UNECA) that increased from 3.7% in the year 2013 to 3.9% in 2014. Most of the citizens in Tanzania are believing and expecting a better future to come for both their children, families and lives. Msigwa (2013) cited in Mbalamwezi (2015) that most of the families have high expectation for their children to have jobs soon after graduating, although many youths are completing school and universities without stable employment, making youth unemployment to be among the major challenges in Tanzania. Statistics have proved that a significant growth of the economy, with moderate inflation rate is

that hopefully there will be more job opportunities especially to those graduands of universities, but actually this still remains as a contradiction that they still encounter. The real and significant question is that, despite significant growth of the economy and government policies undertaken to reduce unemployment and underemployment why is it seen that both challenges are still showing high opposition and threats to people and the country in general.

2.   Literature Review

Phillips Curve Theory

William Phillips through Phillips curve theory investigated the relationship between rate of change in nominal wage and unemployment rate in United Kingdom. Phillips's curve represents an inverse relationship between unemployment rate and inflation rate in the economy (Dritsaki & Dritsaki, 2013). Phillip theory was revised during 1960 after Samuelson and Solow focus on the relationship between inflation and unemployment rather than considering changes in money wages (Samuelson & Solow, 1960). According to this theory, when the rate of inflation in the economy is higher, then the economy will experience a low unemployment rate and vice versa. According to Phillips he discussed that when the demand for labor is high and there are very few unemployed then employers will offer high wage rates above the prevailing rates to attract most seemly workers from other firms and industries. On the other hand, when demand for labor is low while unemployment is high and labors are unwilling to offer their laborer at less than the prevailing rates, the wage rates will fall very slowly. This is because in the period where business activities are falling the demand for labor

is decreasing and unemployment is increasing, in this period employers will be reluctant to increase wage. They will be reducing wages, then again workers and union will be reluctant to accept wage cut and hence employers will be forced to lay off workers leading to a high rate of unemployment. To this case, Phillips (1958) argues the relationship between unemployment and wage rates (inflation) is expected to be non-linear.

Classical Theory of Unemployment

Around 18th centuries, classical school was mentioned as the first school in economics with some of the greatest economists such as Adam Smith, Robert Malthus, and David Ricardo. Such economists believe that the flexibility of wage rate is the one that keeps labor market and the market for labors in equilibrium all the time Houghton Mifflin Harcourt (2016). They argue that unemployment that occurs in the labor market is what we refer to as voluntary unemployment. That is people are unemployed because they refuse to accept the prevailing wage rate and therefore, they assume that labor market depends on the real wage to be exact perfectly flexible and adjust quickly to equalize demand and supply of labor. Moreover, they argue that when supply for labor exceeds demand for labor then wages must fall to restore equilibrium (Ogbeide, et al., 2015). To this attainment, the free-market economy is the one that adjust employment and maintain full employment.

Keynesians Theory of Unemployment

According to Keynes unemployment occurs due to insufficient product demand with the level of wage at or below the Walrasian level. The idea is that when demand for goods or services fall, would lead to lower production as the firms cannot sell their goods as the wage is assumed to be downward-sticky in the Keynesian theory leading to cut of jobs and the number of workers they employ hence unemployment arises. Keynesian theory also emphasizes that as number of labor force unemployed at all times exceeds job vacancies, therefore even if full employment is achieved, still some labor will stay unemployed due to mismatch in the economy (Michael, et al., 2016). Furthermore, Keynes argues that there is a role in government intervention when aggregate demand for goods and services drops as occurred during the great depression. Hence, the Keynesian case, poor growth of the economy is a result of lack of sufficient demand (Abula & Ben 2016) which in turn cause unemployment.

Empirical Literature

Numerous empirical literatures have investigated the relationship between economic growth and unemployment but very few have studied the impact of economic growth and inflation on unemployment rate. First, the study of Thayaparan (2014) who examined the effect of inflation and economic growth on unemployment in Sri Lanka covering the period from 1990 to 2012. A researcher employed a multivariate time series technique including Augmented Dicky Fuller test (ADF), Lag Length criteria, Johansen test for co-integration, Vector error correction model as well as the Granger causality test. The normalized coefficients of the variables obtained using vector correlation model have shown a negative a negative and significant relationship between GDP and inflation with respect to unemployment rate in Sri Lanka. The Granger causality test has also indicated a bi-directional causality existing between inflation and GDP in the economy of Sri Lanka. However, the number of sample size in this study is very small and the methods employed in this study require at

least a large sample size to have more accurate results. But the sample used is 23 observations only.

Secondly, the study of Ajie, et al. (2017) examining the impact of unemployment and inflation on the Nigerian economy for the period of 1981 to 2015. Using the ARDL approach in establishing the long-run relationship they find that unemployment has an insignificant impact on economic growth. However, the negative relationship exists between them. They recommend that the government should regenerate ailing industries as well as establish new ones so as to encourage enormous industrialization which will create more jobs for crowded graduates and reduce unemployment rate in Nigeria. Similar study was conducted in Tanzania Suleiman, et al. (2018), concluding that there is a positive relationship between unemployment and economic growth in Tanzania but significant influence over the study period. Third, the study of Yelwa, et al. (2015) provided the analysis on the relationship between unemployment, inflation and economic growth in Nigeria for the period of 1987 to 2012. By utilizing secondary data, they employ OLS (Ordinary Least Square) methods of estimation on their analysis and found that inflation and unemployment has a negative relationship on economic growth in Nigeria economy. They suggested that there should be free flow of information between employers and employees by the means of cost of job reduction or employees search through job data banks which will lead to increase in efficiency in the labor market. However, OLS method is not robust and does not provide consistent results when variables are integrated of a higher order. Most of these macroeconomic variables are likely to be non-stationary at a level (Nelson &

Plosser, 1982), thus relying on OLS will result in spurious results.

Moreover, the study of Abugamea (2018) analyzed determinants of unemployment in Palestine over the period from 1994 to 2017. They use OLS method to investigate relationship between unemployment with other variables such as GDP, inflation labor force, external trade and restriction on the labor movement. They found that all variables are the main determinants of unemployment in Palestine. It was noted that where GDP is significantly affecting unemployment with a negative relationship. This study employed OLS to non-stationary data series; hence the analysis provided by the study cannot be honored.

Also, the empirical study conducted by Oniore, et al. (2015) focusing on macroeconomic determinants of unemployment in Nigeria using time series data and employing error correction mechanisms. They estimate the long-run relationship using the Johansen cointegration test. The analysis has indicated that GDP growth rate, inflation, openness as well as private domestic investment are statistically significant in influencing unemployment in the short-run, mainly during the study period. And both inflation and GDP are negatively related to unemployment rate. However, methods used in testing for cointegration has to be questionable, as Johansen test for cointegration requires all variables to be I(1), though they conducted the test while their variables contain the combination of I(0) and I(1) series.

Nevertheless, the study by Chowdhury and Hossain (2014) investigated determinant of unemployment in Bangladesh for the period from 2001 to 2011. By employing simple single equation linear regression

model with the variables used in the study including unemployment rate as a dependent variable, inflation rate, GDP growth rate, as well as the exchange rate as explanatory variables. Their result indicates that all variables significantly affect unemployment rate in Bangladesh. Inflation influence unemployment positively while GDP growth and exchange rate have a negative impact on unemployment rate. Furthermore, methods used should be questioned as these variables are very likely to be non-stationary, thus relying on OLS may not provide accurate results.

Additionally, the study in Nigeria by Ademola and Badiru (2016) investigated the effect of unemployment and inflation on economic performance in a respective country for the period from 1981 to 2014. Using OLS with various diagnostic tests they found that, there is a long-run relationship between real GDP, unemployment and inflation in Nigeria; furthermore, unemployment and inflation are positively related to economic growth.

Last but not least, the study of Idenyi, et al. (2017) on the relationship between unemployment and inflation in Nigeria for the period of 1980 to 2015. Unemployment rate was treated as the function of total government expenditure percentage of GDP, money supply percentage of GDP as well as the inflation rate. The study adopted VECM, causality test as well as cointegration test. The result was found to be, there is a significant relationship between unemployment and inflation rate in Nigeria over the study period. Also, a causal relationship was found among the variables in the model. Therefore, recommend government to apply discretionary policy that would reduce unemployment in Nigeria through boosting government expenditure and maintaining stability of money supply.

3.   Methodology

The study used the correlational research design. According to Curtis, Comiskey and Dempsey (2016), correlational research attempts to determine the extent of a relationship between two or more variables using statistical data. In this type of design, relationships between and among a number of facts are sought and interpreted. The researcher used the correlational research design in order to establish the relationship between economic growth, inflation rate and unemployment in Tanzania. The design was suitable in testing hypothesis of this study. Therefore, through the correlational research design, the main objective of the study was achieved. Quantitative research approach was used in this study. The researcher's decision to use the quantitative approach is that it is a means of testing relationships among variables which can be measured by instruments, so that numbered data can be analyzed using specific statistical procedures. This approach helped the researcher to establish the relationship between economic growth, inflation rate and unemployment in Tanzania. The approach also was useful in this study since the researcher collected only secondary data for analysis. The researcher used time series data for the analysis of the impact of economic growth and inflation on unemployment rate in Tanzania. The researcher used credible sites which provide more recent as well as past records of data where sites like World Bank and World Development Indicators (WDI), National Bureau of Statistics were used in the data collection. Variables were used for secondary data to include annual unemployment rate that were measured as a percentage of the labor force in a country that is out of work (Mankiw 2010); annual real GDP rate measured

in percentage as a proxy for economic growth and annual percentage inflation rate. Unemployment rate is treated as a dependent variable while real GDP and inflation rate are treated as independent variables. STATA for statistical analysis package was used in estimating the model, because it is more powerful analytic engine with statistical and econometric tools in analyzing time series data, a forecasting and simulations tools, data handling with presentation features. The researcher also employed Ordinary Least Square (OLS) method as a basis of estimation because of its superiority in taking care of simultaneity and small sample bias.

The researcher identifies unemployment rate as the dependent variable while real GDP rate and inflation is treated as explanatory variables in order to empirically analyze the impact between both independent variables and dependent variable. The model and parameters were estimated at 95% confidence interval (5% level of significance). On estimating the impact of economic growth and inflation, the real gross domestic product was used as a proxy for economic growth.

The mathematical model is identified as unemployment rate (UNEMP) is a function of real gross domestic product (RGDP) and (INFL). That is;

$$UNEMP = f (RGDP, INFL)$$

$$UNEMP_t = \beta_0 + \beta_1 GDP_t + \beta_2 INFL_t + \varepsilon_t$$

Whereby;

UNEMP is unemployment rate measured in percentage

RGDP is a growth rate of real gross domestic product (in percentage) and

INFL is the annual inflation rate measured in percentage

4. Findings and discusions

Unit Root Test for Time Series Data

According to Gujarat & Porter (2009), the regression of a non-stationary time series on another non-stationary time series may produce a spurious regression thus the researcher decided to start by testing for unit root. Hence, in order to verify as to what degree series, share univariate integration properties, the unit root test was performed. The unit root test aim at testing whether the data series is stationary or non-stationary. For that case a researcher employed both Augmented Dickey Fuller and Phillip-Peron unit root test. The test results for each method were provided in Table 4.1 and Table 4.2 below. The test was performed by including trend and constant in a model. The null hypothesis for each test is that the variable has a unit root (non-stationary). The results of all variables at their levels and first differences are presented in table 4.1 and table 4.2 below.

Table 4.1 Augmented Dickey Fuller unit root test

Levels				First difference		
Variables	t-statistics	Critical value 5%	probability	t-statistics	Critical value 5%	probability
Unemployment	-2.665311	-3.695534	0.347	-4.789343	-3.703303	0.003
GDP	-2.766733	-3.695534	0.4532	-8.767899	-3.703303	0.000
Inflation	-1.745658	-3.695534	0.6632	-5.853884	-3.703303	0.0053

Table 4.2 Phillip-Peron unit root test

Levels				First difference		
Variables	t-statistics	Critical value 5%	probability	t-statistics	Critical value 5%	probability
Unemployment	-2.665311	-3.695534	0.347	-4.789343	-3.703303	0.003
GDP	-2.766733	-3.695534	0.4532	-8.767899	-3.703303	0.000
Inflation	-1.745658	-3.695534	0.6632	-5.853884	-3.703303	0.0053

Regression output

Table 4.3 below shows the regression results obtained from STATA, of independent variables that is inflation rate and gross domestic product (GDP) against the dependent variable that is unemployment rate.

Table 4.3 Regression output

```
      Source |       SS           df       MS       Number of obs   =        32
-------------+----------------------------------   F(2, 29)        =     43.45
       Model |  5.27633355         2   2.63816677   Prob > F        =    0.0000
    Residual |  1.76085396        29   .060719102   R-squared       =    0.7498
-------------+----------------------------------   Adj R-squared   =    0.7325
       Total |   7.0371875        31   .227006049   Root MSE        =    .24641


Unemployment |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   inflation |   .0269488   .0086116     3.13   0.004     .0093361    .0445615
         GDP |   -.142817   .0372579    -3.83   0.001    -.2190179   -.0666161
       _cons |   3.304891   .2437917    13.56   0.000     2.806281    3.803501
```

The unemployment rate was set as a dependent variable whereas inflation rate and gross domestic growth (GDP) were set as independent variables. The estimated regression model is desirable when the independent variables are significant to explain the dependent variable. The findings and results from this study portrays that all the variables are significant to explain about the model and thus, concludes that the model is justifiable and can be used for forecasting and prediction.

The overall significance of the model was also taken into consideration whereas the model was estimated at 95% confidence interval and 5% level of significance, thus the probability (Prob > F) from the regression output is 0.0000 which is less than 0.05 which means that the overall model is significant.

Each variable was also tested to verify its significance in the model and the results were as follows, the (P > t) of inflation rate is 0.004 which is less than 0.05 thus makes

the variables significant and (P > t) of gross domestic product (GDP) is 0.001 which also proves the significance of the variable in the model. The R-squared value showed a high explanatory power of the explanatory variables on the dependent variables that is 0.7498 (74.98%) of the variation of unemployment rate which is explained by inflation rate and gross domestic product (GDP) while the remaining percent that is 0.2502 (25.02%) is not explained in the model.

Based on the R2 outcome, the independent variables, inflation rate and gross domestic product (GDP) can influence unemployment rate and the model can be used for prediction. This proposes that policies can be developed based on the relationship in order to reduce the level of unemployment rate in the country. The following is the equation that authenticate the relationship and predict the dependent variable and therefore jointly significant.

$$Unempt = 3.304891 - 0.142817gdpt + 0.0269488Inft$$

The equation above is derived from table 4.4, the regression output, which exhibits the relationship that exists between dependent variable and independent variables from the time series data for the period 1990 to 2021. It discloses the influence of inflation rate and gross domestic product (GDP) in determining the unemployment rate. Also, the overall significance of the model as indicated by the F-statistic shows that the overall model is statistically significance at 5% level of significance since it has the probability value of 0.000 which is less than 5% level of significance.

H_{01}: **Inflation rate has no impact to the unemployment rate in Tanzania**

From the regression model, the result reveals the existence of a positive impact of inflation rate to the unemployment rate in Tanzania. The model shows that if inflation rate increases by 1-unit, unemployment rate will increase by 0.0269488 units, keeping other factors constant. The variable can also be proven to be significant in the model because of its p-value output that is 0.004 at 5% level of significance. Hence, the decision is to reject the null hypothesis that inflation rate has no impact to the unemployment rate.

H_{02}: **Gross domestic product (GDP) has no impact to the unemployment rate in Tanzania**

From the regression model, the result shows the existence of a negative effect of gross domestic product (GDP) and unemployment rate in Tanzania. The model shows that if gross domestic product (GDP) increases by 1-unit, then unemployment rate will decrease by 0.142817 unit, keeping other factors constant. The variable can also be proven to be significant in the model because of its p-value output that is 0.001 at 5% level of significance. Hence, the decision is to reject the null hypothesis that gross domestic product (GDP) has no impact to the unemployment rate in Tanzania.

Economic growth and unemployment rate

The results from the regression output established a significant negative effect of economic growth on unemployment rate in Tanzania. The model shows that, for one percent increase in real GDP it leads to 0.142817 percentage decrease in unemployment rate given that all other factors are kept constant. These results suggest that the real growth rate of the economy is highly associated with the reduction of unemployment rate. This is because the growth of the economy is associated with the increasing investment opportunities, growth of

firms, which in turn creates more employment opportunities and thus leads to reduction of unemployment problem.

Industrialization policy undertaken by the fifth president of Tanzania is also predicted to create more employment opportunities in the long run from the theory of Keynes, unemployment arises due to lack of deficiency demand, which means, when people got the work to do, they will consume more and more leading to both increase in production associated with the increasing demand and decreasing unemployment rate.

Inflation rate and unemployment rate

The regression output also revealed a positive relationship between inflation and unemployment rate in Tanzania. The model shows that, a one percent increase in inflation rate leads to 0.0269488 percent increase in unemployment rate keeping other factors constant. This suggests that a high level of inflation will significantly increase unemployment in the long run. The significant result in this study supports the study of (Idenyi et al. 2017), which also found a positive relationship between inflation rate and unemployment rate.

5.   Conclusions

The results presented, clearly indicated that long run estimates of both economic growth and inflation elasticity were significantly influencing unemployment in Tanzania. Before estimation the unit root was tested using the Augmented Dickey Fuller and Phillip-Peron unit root test to confirm stationary of the variables and to avoid the spurious results.

The results from the regression output shows that the relationship between economic growth and unemployment rate is negative meaning that economic

growth and inflation rate do not move in the same direction, when one increases it basically led to a decrease in the other as observed on the regression model. Not only that but also, the results from the regression output shows that the relationship between inflation rate and unemployment rate is positive meaning that economic growth and inflation rate move in the same direction, when one increases it basically led to an increase in the other as observed on the regression model.

6.   Recommendations

The following are some of the recommendations in this study

i.   Policy makers need to use monetary policy instruments in boosting up the economic growth while maintaining inflation rate at a very moderate level as high inflation rate is the sign of economic instabilities

ii.   In order to reduce unemployment rate in Tanzania more strength and emphasize on industrialization is highly encouraged in order to increase economic growth

iii. Efforts should be made by the policymakers in Tanzania to increase the level of output in the economy by enhancing on productivity in order to reduce unemployment rate.

iv.   And also, the government through BOT should efficiently use monetary and fiscal policies in controlling the flow of money in the economy.

References

Abula, M. & Ben, D., (1981-2015). an Econometrics Investigation into the Impact of Unemployment on Economic Growth in Nigeria. International Journal of Science and Engineering, 2(4).

Ademola, A. & Badiru, A. (2016). The Impact of Unemployment and Inflation on Economic Growth in Nigeria. International Journal of Business and Economic Sciences Applied Research, vol. 9(no. 1), pp. pp 47-55.

African Development Bank, (2016). African Economic Outlook. Sustainable Cities and Structural Transformation.

Arnam, C. V., (2017). The Application of the Phillips Curve in Developed and Developing Counties.

Bernanke, B. S., Laubach, T., Mishkin, F. S., & Posen, A. S. (2018). Inflation targeting. In Inflation Targeting. Princeton University Press.

Bohlmann, H. R., Horridge, J. M., Inglesi-Lotz, R., Roos, E. L., & Stander, L. (2019). Regional employment and economic growth effects of South Africa's transition to low-carbon energy supply mix. Energy policy, 128, 830-837.

Bolton, L. (2016). Unemployment and underemployment data. K4D Helpdesk Research Report. Brighton, UK: Institute of Development Studies.

Chowdhury, M. & Hossain, M., (2014). Determinants of Unemployment in Bangladesh. A case study, Developing Country Studies, vol. 4(no. 3).

Curtis, E. A., Comiskey, C., & Dempsey, O. (2016). Importance and use of correlational research. Nurse Researcher, 23(6).

Dritsaki, C. & Dritsaki, M. (2013). Phillips curve inflation and unemployment: empirical research for Greece, International Journal of Computational Economics and Econometrics, vol. 3(no 1/2), pp. pp 27- 42.

Economics, T. (2018). Unemployment rate. An Encyclopedia of Macroeconomics, 711.

Gujarati, D. & Porter, D., (2009). Basic Econometrics. 5th edition ed. New York, NY, 10020: McGraw-Hill Companies, Inc., 1221 Avenue of the Americas.

Feng, Y., Lagakos, D., & Rauch, J. E. (2018). Unemployment and development (No. w25171). National Bureau of economic research.

Iwasaki, Y., Muto, I., & Shintani, M. (2021). Missing wage inflation? Estimating the natural rate of Unemployment in a nonlinear DSGE model. European Economic Review, 132, 103626.

Kumar, S., Dawson, K., Pollard, R., & Jeter, G. (2022). Analyzing Theories, Conceptual Frameworks, and Research Methods in EdD Dissertations. TechTrends, 1-8.

Khrais, I. & Al-Wadi, M., (2016). Economic Growth and Unemployment Relationship; An Empirical study for MENA Countries, International Journal of Managerial Studies and Research, Volume vol. 4.

Manzoor, F., Wei, L., Asif, M., Haq, M. Z. U., & Rehman, H. U. (2019). The contribution of sustainable Tourism to economic growth and employment in Pakistan. International journal of environmental research and public health, 16(19), 3785.

Mankiw, N., (2010). Macroeconomics. 7th edition Ed. New York, NY: Worth Publishers 41 Madison Avenue.

Roncaglia de Carvalho, A., Ribeiro, R. S., & Marques, A. M. (2018). Economic development and inflation: A Theoretical and empirical analysis. International Review of Applied Economics, 32(4), 546-565.

Singh, D., (2018). Impact of GDP and inflation on Unemployment rate; "A study of Indian Economy in 2011 - 2018". International Journal of Management, IT and Engineering, vol. 8(no. 3), pp. pp. 329 – 40.

Suleiman, S., Kassim, S. &. & Hemed, I., (2018). Unemployment and Economic Growth in Tanzania. Journal of Economics, Management and Trade, vol. 20(no.2), pp. pp. 1- 8.

Thayaparan, A., (2014). Impact of Inflation on Economic Growth in Sri-Lanka: A case study of Time series Analysis, Global Journal of Management and Business Research, Volume vol.13.

Umair, M. & Ullah, R., (2013). Impact of GDP and inflation on Unemployment Rate: A study of Pakistan Economy in 2000 - 2010. International Review of Management and Business Research, vol. 2(no. 2), pp. pp. 388– 400.

Wooldridge, J., (2013). Introductory Econometrics: A Modern Approach. 5th edition ed. South-Western: Cengage Learning.

Wu, J., Wood, J., & Huang, X. (2021). How does GVC reconstruction affect economic growth and Employment? Analysis of USA–China decoupling. Asian-Pacific Economic Literature, 35(1), 67-8.

Yelwa, M., David, O. & Omoniyi, E., (2015). Analysis of the Relationship between inflation, Unemployment and Economic Growth in Nigeria: 1987-2012. Applied Economics and Finance, vol. 2(no 3), pp.102–9.