DOES UNEMPLOYMENT EFFECT ON ECONOMIC GROWTH IN INDIA: AN ARDL APPROACH

Malayaranjan sahoo

Research Scholar, Department of Humanities and Social Sciences National
Institute of Technology (NIT) Rourkela, Odisha.

ABSTRACT

The study examined the effect of unemployment on economic growth in India during 1991-2017. Both short run and long run relation are analyzed through ARDL bound testing approach. The empirical result shows that there is negative relationship between unemployment and economic growth. Unemployment occurs when people are seeking and not working during their working age. This study satisfied Okun's law. Long run cointegration result revealed that unemployment rate increases economic growth by -1.07%. Private entrepreneurship should be encouraged and micro, small and medium enterprises also plays an important role for employment generation in india.

Keywords: Unemployment, Economic growth, ARDL, Okun's law

1. INTRODUCTION

Unemployment is a multidimensional phenomenon; because it affects economic activity of a country as well as social structure of societies. So these two dimension create complexity and impose adopting extensive analysis to solve this problem. The main objective of every policy maker either from fiscal policy or monetary policy is to attain high economic growth. There are many determinants are responsible for detaining growth rate of a country. One of them is high rate of unemployment.. As per Okun's law there is an inverse relationship between economic growth and unemployment rate. When unemployment's fall by 1%, GNP rises by 3%. The main objective of economic policies tends to high economic growth which leads to demand of more job by constructing investment programs. So unemployment is a global phenomena with economic and social effects (Al-Habeas, M.A et al (2012).

As per the Keynesian thought of effective demand, it will increase when per capita income will increases. Effective demand in turn increase production of goods and services in the country.

This increase production leads to more employment opportunity. So cycle of employment-income-demand-production- employment will move. Not only employment increase economic growth but also maintain peace and stability in country (Kiran.R et al 2014).

India is considered as a fast growing economy in the world scenario. The main problems of India is high rate of unemployment and poverty. India's unemployment increased to 3.52% in 2017 from 3.51% in 2016. All time high unemployment faced by India in the year of 1983 i.e. 8.3% and lowest is 3.41% in the year 2014 (ILO 2016). Unemployment is increasing day by day because labor force reached 47.79 crore in 2011 against 18.07 crore in 1971 (Shivanna and Ravindranath 2018). Late Abdulkalam addressed that "India is a country of villages". More than 700 million people living in rural area. So proper connectivity to urban center will provide better economic opportunity enable to divide the barrier of rural and urban. There is also supply side problem in India's labor market due to persistence growth of population. In the same way large scale of population depends on agriculture. So it not only reduce growing unemployment but also underemployment in the economy.

2. REVIEW OF LITERATURE:

Makaringe, Khobai(2018) explored the relationship between unemployment and economic growth on South Africa. Taking the quarterly data from $1994Q_1$ to $2016Q_4$. They used ARDL bound testing approach to show the long run relationship between the variables. They found that there is negative relationship between unemployment and economic growth in short run as well as long run. This also validates the Okun's law (1962), which discovered the linkage unemployment and economic growth. They suggested that government should come up with efficient macroeconomic policies, needful structural change in the economy, stabilizing growth, flexible labour market policies to reduce unemployment rate.

Soylu et al(2018) investigated the impact of economic growth on unemployment in Eastern European countries from 1992-2014 using panel data. It validate the Okun's law and showed there is long run relationship between the variables. They found that 1% increase in GDP, unemployment decrease by 0.08%

Abdul-Khaliq and et al (2014) examined relationship between unemployment and GDP growth in case of nine Arab countries during 1994-2010. To validate the Okun's law the study used pooled EGLS and found that there is negative relationship between economic growth and unemployment rate. They found that 1% increase in GDP growth rate decrease unemployment rate by 0.16%.

Al-Habees., & Rumman. (2012) verified the causal relationship between economic growth and

unemployment rate. The study focused on some Arab countries and more details analysis for the case of Jordan. They used application of Okun's law, which shows the linkage between potential or actual rate of economic growth and unemployment rate prevailing in an economy. They indicate that high growth rate leads to high operational rate which reduce unemployment rate. They found that rich Arab countries are less unemployment than poor Arab countries. They attributed that main cause of unemployment in Arab countries due to political, social and economic instability and high population growth rate. They suggested that social development is most important for efficiently and effectively increasing of growth rate. Separate policies should be need to address the problems in Arab country.

Omitogun & Longe(2017) examine the linkage of unemployment on economic growth in case of Nigeria. The VAR approach used for analyzing data from 1986 to 2016. High level of corruption, mismanagement of public fund are main reasons for unemployment in Nigeria. They found that unemployment, inflation, and other economic variables are significantly affect economic growth.

Muhammad (2014) investigated the effect of inflation and unemployment on economic growth of Pakistan during 1980 to 2010 using the Auto regressive distributed lag. He stated that the effect of inflation varies from economy to economy and many study found that there is positive relationship between inflation and economic growth. The study found that there is a long run relationship between macro variables. Study used Ramsey reset, hetroskedastcity, serial correlation and stability test, found that model is appropriate for the study. It was recommended that private entrepreneurship should be come up to reduce unemployment in the economy.

Eze and et al (2016) examined the relationship between economic growth, structural change and unemployment in case of Nigeria during 1980-2013. The cointegartion analysis and VECM approach are used to show the results. The study reveals that structural change affect both economic growth and unemployment. They found that unemployment has negative and significant impact on economic growth. it was recommended that Govt. should create more employment, modernizing agricultural sector, so that some part of total labour force will absorb by agricultural sector despite of profession and skill.

Nikolli (2014) wxamined the relationship between economic growth and unemployment rate in Albania. As Okun's law state that, 1% decline in unemployment rate leads to GDP will increase by 3%. The study analyzed data from 2000 to 2013 by using regression between gross domestic product and unemployment rate. The study does not found any significant or stable relationship between economic growth and unemployment rate due to economic crisis during this period.

Enejoh & Tsauni (2017) discussed the relationship between economic growth and

unemployment rateon Nigeria over the period of 1970-2016, by using Johansen cointegartion and error correction tool for analyzing short run and long run relationship between the variable. The ECM is negative and significant at 5% level of significance. They found that unemployment granger cause GDP but GDP does not cause unemployment rate in Nigeria.

3. THEORETICAL FRAMEWORK AND BACKGROUND:

Economic growth and unemployment are clearly discussed by different school in different way. Adam smith claim that economic growth can be possible by division of labor and specialization. Followed by classical economist Karl Marx considered surplus value is only means of increasing production or economic growth in a cumulative process (Ajamieh, M., 1983). In his theory entrepreneur plays an important role for increasing production or economic growth. Rosto stages of economic growth is one of most important theory of growth. He discussed that from traditional society to high mass consumption, he puts different conditions in each stage to achieve high growth rate. Harrod-Doamar more focus on investment for economic growth. On the other hand, Arthur Lewis states that movement or shifting of surplus labor from agricultural sector to industrial sector for the economic development. Keynesian theory on economic growth and development based on demand side. In his book "The General Theory of Employment, Interest and Money" particularly with regard to the role of government in stimulating and regulating a nation's economic life.
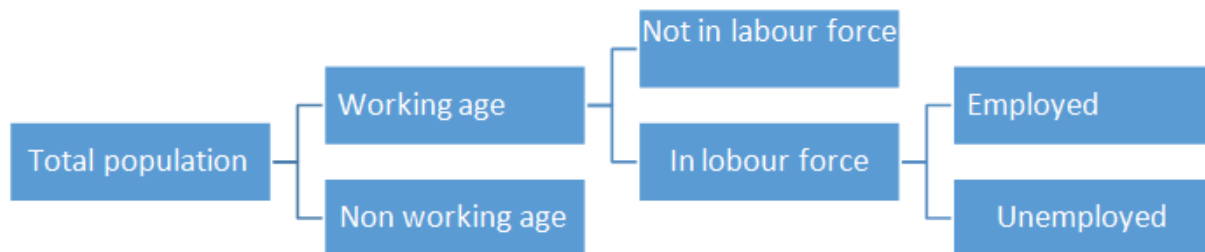
From the above theories we can conclude that though there is high correlation between economic growth and unemployment. There should be separate policies for growth and unemployment. So that nation will achieve both high economic growth as well as low unemployment.

3.1 Okun's law:

Great challenge for every policy maker is to reduce unemployment rate with high economic growth rate. Many economist framed and investigated the relationship between economic growth and unemployment. Arthur Okun's first started the relationship between economic growth and unemployment rate. He states that 1% decline in unemployment will increase economic growth by 3%. More apparently output depends on the amount of labor used in the production process. So higher the participation of labor force in the production process higher will be the output that leads to high rate economic growth.

The entire population of country is divided into two categories i.e. working and non-working age. Working age refers to the population under the age group of (16-64). Working age population is segmented into two types in labour force and not in labour force.

Population of country divided into two categories i.e. working age and non- working age. Working age refers to the population under the age group of (16-64) years. Which is also segmented into two i.e. in labour force and not in labour force. In labour force means they are engaged in economic activity and produce goods and services. Similarly labour force parts into two categories i.e. employed and unemployed. Unemployed means, those person who are actively looking job but not currently employed.

$$\text{Unemployment rate} = \frac{unemployed\ workers}{Total\ labour\ force} * 100$$

Unemployment rate is the number of unemployed to total labour force in a country.

4. METHODOLOGY:

The study used time series data collected between 1991 to 2017 in India. It consist of two macro variables i.e. economic growth proxied as real GDP and unemployment rate as unemployment to the total labor force in the economy. The source of data is world development indicator (World Bank 2017). The ARDL model employed to analyses the data. Bound testing approach is used to show the long run relationship between unemployment and economic growth. Error correction model is used to correct short run disequilibrium and make variables equilibrium in the long run.

After going through various literatures on economic growth and unemployment rate, this study follows (Makaringe and Khobia, 2018) method of modified version of Okun's law Okun A. (1962). That is real GDP taken as dependent variable and unemployment rate as independent variable. In this way we attempt to show the relationship between economic growth and unemployment rate.

RGDP= f(UNEMPL)…   (1)

RGDP= $\beta1 + \beta2Unempl + \mu$

Where RGDP= constant GDP

UNEMPL= unemployment rate

$\beta1, \beta2$ are Parameters

μ= error term

$\beta1, \beta2$ are negative (a priori expectation)

The study employed stability properties of variables. It use two unit root test that is Augmented Dickey-Fuller and the Pillip- Perron test for consistency and comparison of the result. The study will be applied bound testing approach to test for cointegration, as proposed by Pesaran(2001) within an Autoregressive distributed lag model. ARDL model is an appropriate technique can be used when variables are stationary at different level I(0) or I(1) or both. It also hold good in case of small sample size. Optimal lag order should be need for testing the model.

$$\Delta Yt = \beta_0 + \sum_{i=1}^{n} \beta_i \, \Delta Y_{t-1} + \sum_{i=0}^{n} \sigma_i \, \Delta X_{t-1} + \varphi_1 Y_{t-1} + \varphi_2 X_{t-1} + \mu_t \quad (2)$$

5. RESULTS AND DISCUSSION:

The ADF and PP tests are used in order to show the stationary and order of integration. Both test have null hypothesis is that variables has unit root but the alternative hypothesis states that variables has no unit root.

Table 5.1: Unit root tests

	Levels		First difference	
variables	ADF	PP	ADF	PP
GDP	10.69	12.67	-3.99**	-8.80**
UNEMPL	-0.71	-0.9	-4.21**	-4.21**
Value marked with ** represents stationary at 5% level of significance				

Source: Author's own calculation

The above table (5.1) reveals that both variables has unit root(non-stationary) at level, means we can't reject null hypothesis. After first difference both variables are stationary at 5% level of significance and we reject the null hypothesis and accept alternative hypothesis i.e no unit root. It

means that both variables are integrated of I(1).

5.2 Test for long run relationship between variable:

The first stage of ARDL model is to select optimal lag structure. As per AIC and SIC values, it is determined that lag one for both the variables are best for the model ARDL(1,1). For the existence of long run relationship between the variables are test by F statistics. The computed F=8.51[0.002], which is more than the critical upper bound values computed by Pesaran, Smith, Shin (2001) at 95% level given by 2.265-3.513. Since the null hypothesis of Wald test is there is no cointegration between the variables. Though F statistics value is greater than critical upper bound, it reject null hypothesis and accept alternative hypothesis i.e. both variables are cointgrated(there is long run relationship between the variables). The ARDL model with lag one is given below.

Table 5.2: Auto regressive lag estimation

ARDL (1,1) model dependent variable is GDP

Regressor	Coefficient	Std. error	t-statistics
GDP	-0.13	0.27	-0.48
GDP(-1)	0.08	0.02	4.12
UNEMPL	-6.16	3.39	-1.55
UNEMPL(-1)	1.89	1.56	1.21
C	-8.3	6.73	-1.23

Source: Author's own calculation

5.3 Diagnostic test:

The results of diagnostic are shown below in the table (5.3). This indicate that model has no serial correlation, homoscedasticity and normal distribution.
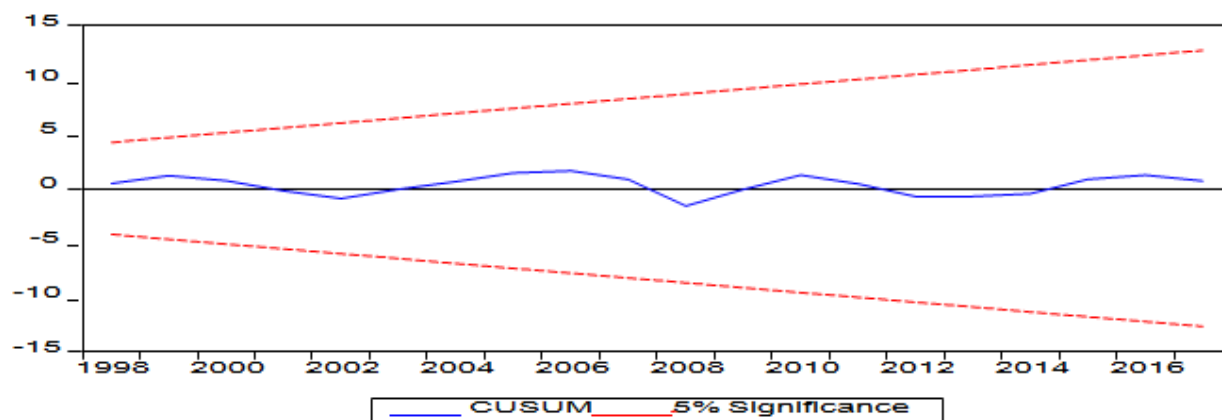
Table 5.3: diagnostic tests

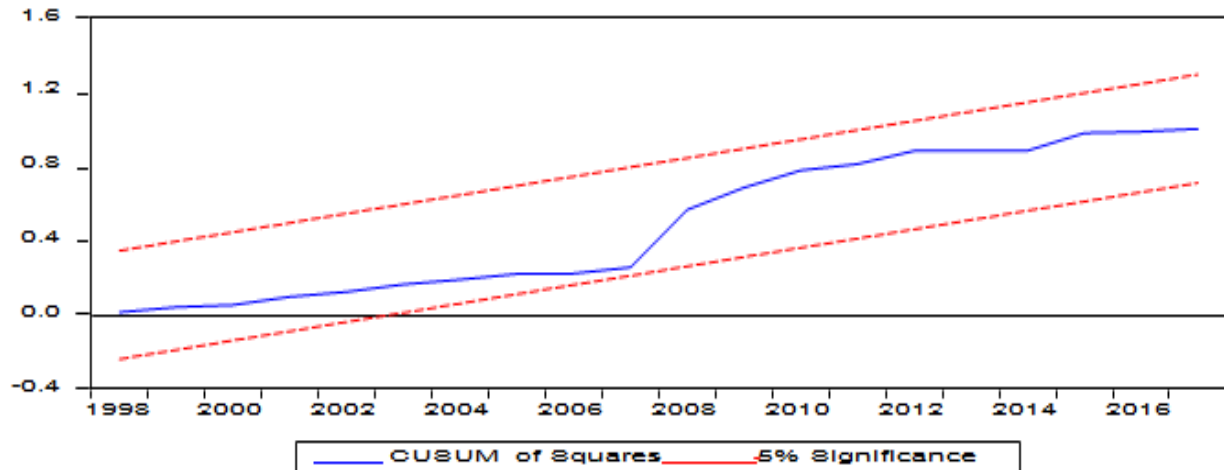| Test	Null hypothesis	Test statistics	Probability
Serial correlation	No serial correlation	0.02	0.87
Heteroskedasticity	homoscedasticity	1.67	0.19
Jarque-bera	There is normal distribution	2.55	0.27

Source: Author's own calculation

Table (5.4) and (5.5) tests the CUSUM and CUSUM square for stability properties. It point out that both test are satisfy the properties because both residuals are lies within the range of 5% level of significance.

5.4 CUSUM test

Source: Author's own calculation

5.5 CUSUM squared Test:

Source: Author's own calculation

5.6 Long run cointegration results:

The send stage of ARDL model is to determine long run relationship between the variables. As per AIC and SIC criteria the ARDL model given below.

ARDL (1, 1) Dependent variable is GDP

Table 5.6: long run relation

Variables	Coefficient	Std. error	t-statistics	Prob.
UNEMPL	-1.07	3.25	-3.3	0.0029
C	5.4	1.27	4.25	0.0003

Source: Author's own calculation

The result obtained from the above table (5.6) confirmed that there is negative relationship between the economic growth and unemployment rate. 1% increase in unemployment rate GDP decreases by 1.07%. If unemployment will decline then it may increase economic growth of country because more the employment more will be the production in a country.

GDP = 5.40+12 - 1.07*UNEMPL

5.6 Short run analysis:

After estimating the long run relationship between the variables, next stage of ARDL model is to test the short run dynamic in the model. The result shown in the table(5.7) point out that ECM(-0.03) is negative and significant, which confirms that there is long run relationship between the variables. The result indicate that long run level of economic growth rate adjusted by 3% over the years. So this implies that unemployment rate hinders economic growth.

Table 5.7: short run diagnostic

Regressor	Coefficient	Std. error	t-ratio[prob]
DGDP	0.56	0.18	3.08[0.00]
DUNEPML	-2.11	4.46	-0.47[0.64]
ECM(-1)	-0.03	0.01	-2.25[0.03]
C	3.98	1.54	0.89[0.01]

Source: Author's own calculation

$$\Delta GDP = 3.9829089 + 0.56*\Delta(GDP(-1)) - 2.11\Delta(UNEMPL(-1)) - 0.03ECM(1)$$

CONCLUSION:

The study investigates the impact of unemployment on economic growth for India from 1991-1994 using ARDL approach, it was revealed that there were negative relationship between the variables. As long run cointegration result revealed that unemployment rate increases economic growth by -1.07%. Which satisfy the Okun's law (1962).

From the above empirical results, this study will provide policy makers a better understanding about the relationship between economic growth and unemployment rate. Formulate separate policies, more importance should be given for reduce unemployment rate. Private entrepreneurship should be encouraged and micro, small and medium enterprises also plays an important role for employment generation.

Employment→ income→ demand for goods and services→ more production→ Economic growth

REFERENCES

Abdul-Khaliq, S., Soufan, T., & Shihab, R. A. (2014). The relationship between unemployment and economic growth rate in Arab Country. *Journal of Economics and Sustainable Development, ISSN*, 2222-1700.

Ajamieh, M. (1983). Introduction to the Development and Planning. *Renaissance House, Beirut*, *56*.

Al-Habees, M. A., & Rumman, M. A. (2012). The relationship between unemployment and economic growth in Jordan and some Arab countries. *World Applied Sciences Journal*, *18*(5), 673-680.

Anghel, M. G., Anghelache, C., & Manole, A. (2017). The Effect Of Unemployment On Economic Growth. *Romanian Statistical Review Supplement*, *65*(7), 174-186.

Castells-Quintana, D., & Royuela Mora, V. (2012). Unemployment and long-run economic growth: The role of income inequality and urbanization. *Investigaciones Regionales, 2012, vol. 24, p. 153-173*.

Enejoh, S. Y., & Tsauni, A. M. (2017). An Analytical Study of the Impact of Inflation on Economic Growth in Nigeria (1970-2016). *International Journal of Academic Research in Accounting, Finance and Management Sciences*, *7*(4), 110- 120.

Garavan, s. Okun's law: an empirical investigation into eurozone growth and unemployment.

International Labour Office (ILO). (2016). *World employment and social outlook: Trends 2015*. Geneva: ILO.

Kiran.R, Subashini K, Dr.M.K. Nagamani(2014). Impact of Economic Growth on Employment in India. International Journal of Innovative Research in Science, Engineering and Technology Vol, 3(4).

Makaringe, S. C., & Khobai, H. (2018). The effect of unemployment on economic growth in South Africa (1994-2016).

Mohseni, M., & Jouzaryan, F. (2016). Examining the Effects of Inflation and Unemployment on Economic Growth in Iran (1996-2012). *Procedia Economics and Finance*, *36*, 381-389.

Nagel, K. (2015). Relationships between unemployment and economic growth– the review

(results) of the theoretical and empirical research. *Journal of Economics & Management*, *20*, 64-79.

Nikolli, E. (2014). Economic growth and unemployment rate. Case of Albania. *European Journal of Social Sciences Education and Research*, *1*(1), 217-227.

Okun A. (1962), "Potential GNP: Its Measurement and Significance in Statistics Section?" American Statistical Association, Washington DC.

Omitogun, O., & Longe, A. E. (2017). Unemployment and Economic Growth in Nigeria in the 21st Century: VAR Approach. *Acta Universitatis Danubius. Œconomica*, *13*(5).

Pesaran M., Shin Y. and Smith R. (2001). "Bounds testing approaches to the analysis of level relationships", *Journal of Applied Econometrics* 16(2), 289-326

Shivanna T Dr. Ravindranath N.Kadam(2018). Unemployment among sc's and st's in india: need for special care

Soylu, Ö. B., Çakmak, İ., & Okur, F. (2018). Economic growth and unemployment issue: Panel data analysis in Eastern European Countries. *Journal of International Studies Vol*, *11*(1).

Zagler, M. (2009). Economic growth, structural change, and search unemployment. *Journal of Economics*, *96*(1), 63-78.