# Relationship between Economic Growth and Unemployment; Measuring Okun's Coefficient for Bangladesh

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***Abstract*: This paper intends to determine the Okun's coefficient and the validity of Okun's law in Bangladesh. Moreover, further analysis is done to determine the impact of female unemployment on economic growth of Bangladesh. We have used time series annual data of Bangladesh with a time period from year 2000-2019. The Hodrick-Prescott filter detrending technique has been used to generate the unemployment gap and output gap, two unit root tests have been done to check for stationarity of the data collected i.e. Augmented Dickey Fuller test and the Phillips-Perron test, the Johansen co-integration test has been performed to check for long run cointegration between the variables and finally the Ordinary Least Square (OLS) regression is used to determine the type of correlations between the variables and finally two tests have been performed (Breusch Pegan and White test) to check for heteroscedasticity in the error term.**

***Key Words*: Unemployment, Ukun's law, Regression, Economic Growth, Heteroscedasticity**

## I. INTRODUCTION

The macroeconomic issue namely 'Unemployment' is a significant factor that represents a great deal regarding the performance of a country especially the growth level. Moreover, when the term is linked with the output level of a country and their relationship is analyzed, a bigger picture of the country's performance can be presented in terms of output level as a result of job availability.

The term 'unemployment' refers to the situation where people, from the working population, are willing to do work and are actively searching for jobs but unable to find one. Unemployment is considered to be a matter of great crisis, faced by most of the developing countries, including Bangladesh. A higher level of unemployment means that the human capital is not being utilized efficiently and many graduate students (the youth population) are not getting the required jobs; the unskilled labors are not being given proper training and hence jobs.

In most of the developing countries, the basic reason of unemployment comes from an imbalance between the availability of jobs and the supply of labor. In Bangladesh, the Dhaka city is the most crowded as majority of the population comes here from rural areas in search for a job and many of them end up having no jobs at all. As a result, there is a surplus of labor compared to the amount of job opportunities. The overall situation leads to a downfall in the level of economic growth of the country. In Africa, the unemployment has been on its peak where most of the families did not have enough income and a better standard of living, leading to poverty as a result of the decline in its economic growth (Kareem 2006).

On the other hand, it is seen from the records that the unemployment rate has not seen a significant improvement, compared to its economic growth. A rise in technological advancement, leading to capital-based industries is hampering the labor job market. According to the recent research of the Bangladesh government, 2.6 million people of the country are unemployed though the rate fell from 5% in 2009 to 4.2% in 2019 due to the availability of few job opportunities during that time of the year.

It is also, recently observed by the analysts that the rate of unemployment showed in statistics are masked from the real one. This is because unlike western countries, Bangladesh does not provide state benefits or any such securities of unemployment periods to the people. Bangladesh has ample amount of active young population ready to work i.e. around 50%, compared to that in Europe which is around 20-25 percent. Therefore, the government should make the maximum use of this opportunity as the young population is the main booster of the economy of a country, by providing adequate jobs.

The economy of Bangladesh has seen an upward trend for the past few years, improving the social imbalances and reducing the poverty level. The IMF forecasts in 14$^{th}$ April 2020, estimated the GDP growth rate to be around 8% and a decline by 2% in 2020 due to the outbreak of the COVID-19 pandemic, then a boost of 9.5% of growth in 2021. (Yeasmin and Chowdhury, 2014), recommended that if the government debt issues, exports, remittances and FDIs are managed properly, it can contribute to the development of the country.

On the other hand, women employment plays an important role in the growth of the economy. In developing countries, this is specially required for household income, adding up to the labor force of the country and most importantly, for the women empowerment. It has been seen that with the emerging economy of Bangladesh in the last few years, women labor participation rate has also accelerated. Moreover, with increased modernization and industrialization of the country, the gap between the male labor force participation and that of female has narrowed significantly within the time frame of 2000-2010. From 2015-2017, the number of female workers has increased rapidly than men by 4.6% whereas for men it is 1% and the total labor size increased by 2.3%, according to the Bangladesh Bureau of Statistics (BBS).

This paper intends to throw light on how much Okun's law is applicable in Bangladesh. Moreover, a further analysis will be shown on how the female unemployment level affects the economic output of the country. Gender discrimination is one noticeable issue which can be resolved to a great extent, with economic growth. The annual real GDP is taken as the variable to represent the economic growth; annual unemployment rate and annual female unemployment rate from 2000 to 2019 are taken to represent the crisis of job availability of the country.

*1.1 Statistical Analysis*

- *Real GDP*

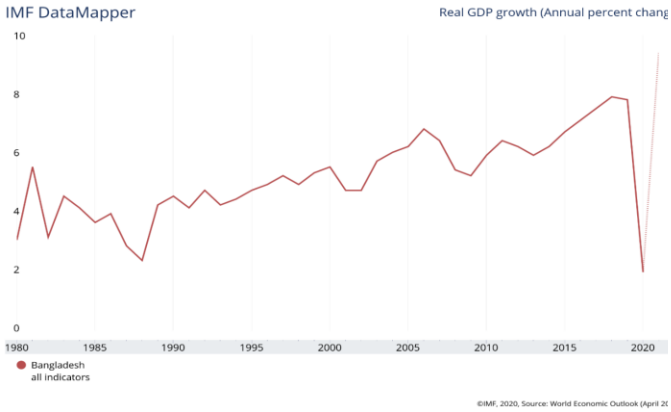



Figure 1.1a

Figure 1.1a shows the graphical representation of the annual real GDP growth of Bangladesh from 1980 to 2020. The growth rate is the lowest in 2020 i.e. about 2.01 % and the highest in 2019 i.e. around 7.3%. According to the economic indicators of Bangladesh in 2019, the government had a lower gross debt due to contractionry fiscal policy. The textile export sector was showing a higher performance with increasing exports. As a result, the current account deficit declined to around 2.7% of the GDP of that year. However, in 2020, due to the pandemic of COVID-19, the GDP faced a significant decline to around 2.0%.

- *Unemployment rate*

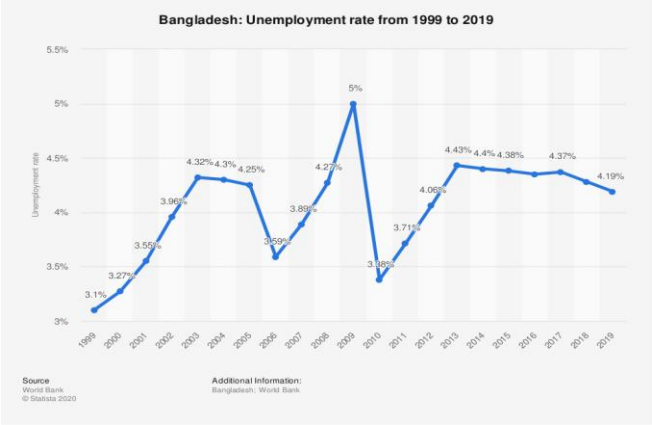



Figure 1.1b

The major employment sectors of Bangladesh are the Agriculture, Industry and the Service sector where 39.7%, 20.5% and 39.8% of the total workforce are employed respectively. These three sectors also cover 13.1%, 28.5% and 53.5% of the country's GDP respectively. Figure 1.1b shows the graphical representation of the overall unemployment rate of Bangladesh from 1999 to 2019. It can be seen that the lowest rate was in 1999 and the highest in 2009. According to the Bangladesh Bureau of Statistics (BBS), the official unemployment rate from 2016 to 2018 was 4.2% but the youth unemployment has contributed mostly to its increasing rate. Around 29.8% of the young population are not provided with proper education or trained for work. As a result, this has given rise to the unskilled labor population and thus, the human capital is being wasted in the economy.

- *Female Unemployment rate*

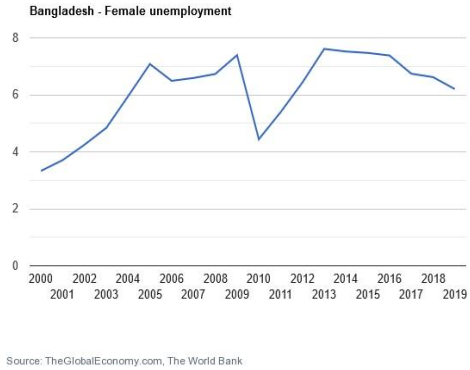



Figure 1.1c

The figure above shows the female unemployment rate in Bangladesh of the past 20 years. It is seen that the highest unemployment rate was about 8% in 2013. The total employment rate in 2013 was 4.43% and the real GDP was around 6%. The lowest unemployment rate of females was about 3.5% in 2000. The real GDP at that time was around 5%. It can be seen apparently that the female

unemployment rate has a positive correlation with the economic output level i.e. the real GDP. Therefore, further tests have been performed to verify this observation.

## II. LITERATURE REVIEW

There have been several studies that were conducted regarding the impact of unemployment on Economic Growth and many macroeconomic and microeconomic factors have been used to try to determine to determine the effect. Some researchers have worked with developed economies to find a relationship between these two variables while others have worked with mostly developing economies to see if there exists a similar phenomenon in these countries.

The relationship between Unemployment and Economic Growth was first officially confirmed by Okun (1962) who was analyzing the potential output of United States and discovered an inverse relation with unemployment. Okun (1962) was able to show through his analysis that a growth in labor force lead to more production of good and services and whenever unemployment levels decreased real growth rates were positive and whenever unemployment fell the growth rate was either stagnant or even negative at times.

Aghion and Howitt (1992) worked with 20 OECD countries, using economic growth as a determinant for unemployment and took the data span of 1974-1989. They used the cointegration analysis and their study concluded an inverse relationship between the two variables.

Barreto and Howland (1993) worked with Japanese economy and used the data span of 1953-1982 with regression estimation. They showed the invalidation of Okun's law for Japan.

Due to a variety of findings in different studies done on different countries and different time periods, policymakers have always been divided on this topic.

This paper provides a brief overview of the various researches that looked in to the relationship between economic growth and unemployment levels. According to Okun's (1962) findings – if Gross Domestic Product of a country increases exponentially then Unemployment Rate falls; if the GDP growth is stagnant of negative than unemployment rate increases. Finally, if growth reaches it's potential level then unemployment levels remain unchanged. Following his findings, a lot of research was conducted on this topic to see if such a relationship actually exists or not.

The job search model by Mortensen (1970) and Lippman and McCall (1976) was used to assess the determinants of unemployment. The model shows that unemployment depends upon the type of job offered and whether it will be accepted or not. The job offer in turn, depends on the skills, education level, demand and work experience of labor.

Baker and Schmidt (1997) worked out the Okun's coefficient with the panel data of OECD countries and found out that the relationship between the job and output level was much more volatile between the year 1980-1990 than that of the 1960s.

Kalim (2003) did her research for the same purpose in Pakistan. She used macroeconomic variables of real GDP growth and population growth as determinants of unemployment and did a statistical analysis on them over the time span of 1986-1999. Her study showed a positive relationship between population growth and unemployment and a negative correlation between the real GDP growth and unemployment rate.

Knotek (2007) was able to estimate Okun's law using three different versions. By using the Dynamic, Gap and Difference model he was able to calculate the unemployment level by current output and past output levels and showed that a sudden fall in economic growth is not always coincided by rising unemployment levels.

Freeman (2001) tested the theory of Okun for a few different developed economies using method of trend decomposition and found that even though Okun's coefficient was 3% increase in GNP for 1% fall in unemployment rate, the coefficient has now changed to about 2% change in GNP over time.

Akhtar and Shahnaz (2005), determined the factors of youth unemployment by taking data from 1991-2004. They worked with both micro and macro variables of this issue in Pakistan. They found out that, the level of unemployment decreases if the GDP rate per year is greater than 4.25%. Moreover, the GDP growth rate contributes to a greater extent to decline female unemployment.

Roger Perman and Christophe Tavera in 2005 found out that the Okun's coefficient forms an important macroeconomic factor in terms of the variations in unemployment rate relative to the deviations in the economic activity.

Hubert (2005), implied that the Okun's coefficient partly, but significantly, depended on the performance or the elasticity of the labor market. He concluded that countries with less restrictions, have a stronger relationship between the unemployment gap and the output gap than that with more restrictions.

Demirgil (2010) tested the significance of Okun's law in Turkey by taking quarterly data from 1989 to 2007. He found out that the unemployment level is highly ineffective to the economic growth during that time frame as Turkey was going through structural changes rather than cyclical development in the early 2000s.

Farole et al. (2017) and Bartolucci et al. (2018) differentiated a group of countries in terms of their per capita GDP in four catagories; high income, upper middle

income, lower middle income and low income). They concluded their results with reliable findings that changes in unemployment rate is more sensitive to GDP in countries with 'high income' economies.

Kabeer et al. (2018) looked into other policy-oriented factors such as education, household family planning, microcredit opportunities, export industries etc. which played a very significant role is widening the socioeconomic orbit of female workers in the labor market. Heintz et al. (2018), carried out a research of primary survey in the rural areas of Bangladesh where he worked on how the migration, access to electricity, usage of mobile phones, RMG and education, affect the participation of women in the labor market. It was seen that certain cultural restrictions were present e.g. married women were not allowed to contribute to such employment.

Hawkins and Li in 2021, used the time series data of unemployment rate and the natural logarithm of the time series data of real GDP growth rate from the OECD of U.S and G7 countries. They run the Hodrick-Prescott (HP) to use the cyclic component of both the output and unemployment gaps. They observed, using the discrete fitting of the anelastic form of Okun's law that their parameters are very much significant and that the effect of Okun's law is mostly noticeable in the times of recession because according to them, it is the time when the economy '*experiences the largest dynamic range of the output gap.*'

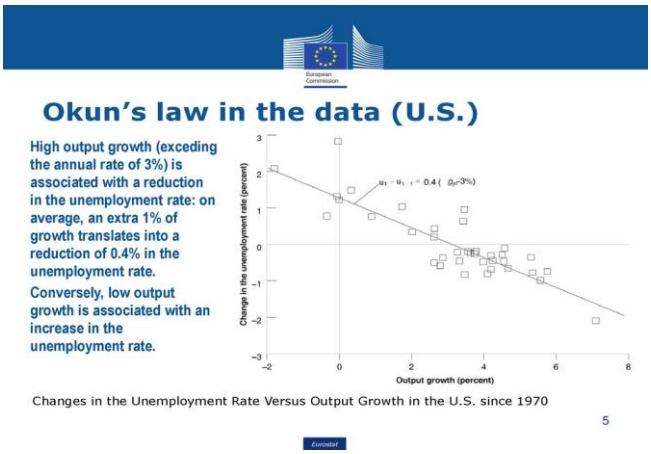
Many other studies have included more variables in their analysis of Economic Growth and Unemployment and one such paper is by Alrayes and Wadi (2018) who looked in to the factors that led to rising unemployment in Bahrain. They looked in to impact of factors such as inflation, government spending and investment and concluded that Economic Growth and Inflation have no effect on Unemployment levels. Sahoo (2019) conducted a similar research using the same methodology and variables for India between 1990 to 2018 and found that unemployment has a positive correlation between Economic Growth and Gross Capital Formation.

Stamatiou and Ritsakis (2016) applied the ARDL model for data from Greece between the years 1995 to 2015. They were able to show a unidirectional causal relationship between Unemployment and Economic Growth. A similar research was done on Turkey by Tiriyaki and Ozkan (2011) using data from 1998 to 2010 and they too found a one way causality between unemployment and Economic Growth.

Most research in Developing countries confirm Okun's (1962) relationship between real output and unemployment levels but the coefficient value varies from country to country depending on the time span considered for their research and also the nature of growth that was achieved in their country.

## III. THEORETICAL FRAMEWORK; OKUN'S LAW

In the early 1960s, the Yale professor and economist, Arthur Okun studied the statistical relationship between a country's unemployment level and the real GDP. According to the economic research team of the Federal Reserve Bank of St. Louis, Okun's law explains by how much the real GDP drops as the unemployment rate rises above its natural rate. It further explains that the amount of output of the economy is closely related to the number of labors used for production. Therefore, employment and the economic growth are positively linked and shares a negative relationship with the unemployment level. He postulated in his original paper that was published in 1962 that a 1% decrease in unemployment will raise the real economic output by 3% according to the U.S economy. Hence, the real GDP rate must be equal to the rate of potential output for the unemployment rate to stay at its natural rate. As the aim is to reduce unemployment level, the country must operate above its potential output level. This was called the "*Rule of Thumb".*




However, according to the recent times, to decline the unemployment rate by 1% over a specific year, the real GDP must grow 2 percent faster than the potential real GDP of that time period. For instance, if the potential rate of GDP growth is 2%, the real GDP must grow at the rate of 4% to achieve a 1% decline in unemployment rate.

Okun's law has a significance in theoretical perspective. In the theoretical point of view, this law is linked at the very basic with both the old and new Keynesian system. Moreover, this can be associated with the Phillip's curve to derive the aggregate supply curve of an economy. The empirical perspective emphasizes on the 'rule of thumb' for forecasting and policy making.

## IV. MODEL SPECIFICATION

In 1970, Okun suggested two major, standard model specifications of his law. First is the 'First Difference' model and the other one is the 'Gap Model'. In the First Difference model, the data (natural rate of unemployment and rate of growth of potential output) are assumed to be

constant. Therefore, the model depicts the first difference of the observed natural log of real output to the first difference of the observed natural log of unemployment rate. The model is expressed as;

$$Y(t) - Y(t-1) = \alpha + \beta \{Ut - U(t-1)\} + \varepsilon(t)$$

where Y is the real GDP in year 't', U is the unemployment rate in year 't', β is the Okun's coefficient and 'α' is the intercept.

The Gap model deals with the cyclical component of unemployment and the cyclical level of real output. It depicts the relationship between the gap of observed and potential real output to the gap of observed and natural rate of unemployment. Therefore, the model is expressed as;

$$Y(t) - Y^*(t) = \alpha + \beta \{U(t) - U^*(t)\} + \varepsilon(t),$$

where Y* is the potential output in year 't' and U* is the natural rate of unemployment.

In this paper, the Gap model is used to represent the significance of Okun's law in Bangladesh. The only drawback of this model is that the Y* and the U* have to be estimated due to inaccessibility of its observed data. For this, I have generated the trend series of both the real GDP and unemployment rate by using the Hodrick-Prescott (HP) detrending technique.

*4.1 Data source & Methodology*

The annual data (real GDP, unemployment rate, female unemployment rate) of Bangladesh from 2000-2019, have been collected from World Bank website and it is a secondary data. The data analysis has been done in five major steps; 1) The output gap and the unemployment gap are generated using the Hodrick-Prescott detrending technique, 2) Unit root tests are performed i.e. the Augmented Dickey-Fuller test and the Phillips-Perron test to check for stationarity of the data and to prevent any spurious regression ahead, 3) The Johansen Cointegration test is performed to check the presence of any long run relationship between the variables, being worked with. 4) The Ordinary Least Square (OLS) regression is performed to determine the correlation among the variables. 5) Heteroscedasticity tests (Breusch Pegan and White) are done to check for variance in the error terms with the explanatory variables.

*4.2 Empirical analysis*

The aforementioned data explanations have given a slight idea about the situation of Bangladesh for the past 20 years regarding how the unemployment rate affected the real GDP growth of the economy. However, a further analysis is required to determine whether it is as it seems and how the future will carry this situation ahead.

- *Generation of the Output and Unemployment Gap*

The Gap Model of Okun's law is based on the gap between the cyclical components of observed and the potential real GDP and natural rate of unemployment. The output gap is represented by the difference between the observed output and the potential output (Y-Y*) and the unemployment gap is represented by the difference between the observed rate and the natural rate (UN-UN*). These gaps are generated using the HP filter detrending technique. According to Backus and Kehoe (1992), the smoothing parameter, "θ" is set as 100 for annual data, to compute the cyclical components using the HP filter. The natural log of the unemployment rate, female unemployment rate and the real GDP rate are taken to work with and the trend and business cycles have been generated for both sets of variables (real GDP vs. unemployment rate and real GDP vs. female unemployment rate). The trend and business cycles of the real GDP, unemployment rate and female unemployment rate with output show an overall inverse relationship, suggesting to follow the Okun's general rule.

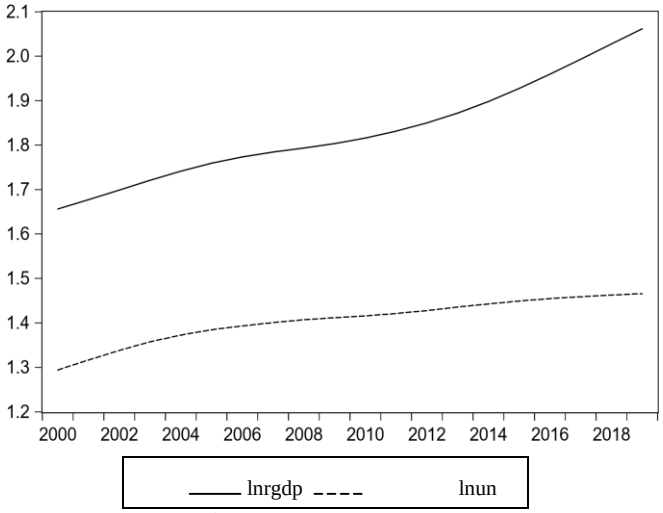



Fig.4.2a Trend of UN & RGDP, Source: E-views generation

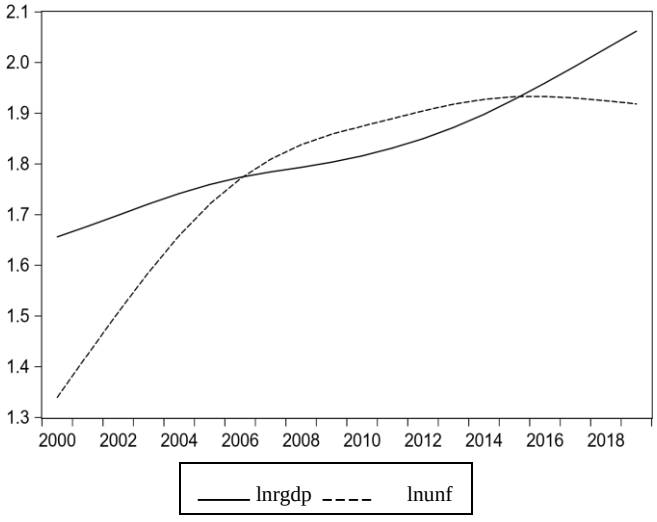



Fig.4.2b Trend of UNF & RGDP, Source: E-views generatio

- *Unit Root Analysis*

The unit root test analyses the stationarity of the data. A stationary data implies that there is no unit root and its statistical measures such as mean, variance, standard deviation etc. are constant throughout the time and it will give accurate results from regression. On the other hand, a non-stationary data implies that there is a unit root which means that its statistical measures change over time. As a result, they generate a spurious regression. The null hypothesis for the unit root test is;

$H_0$: variable has unit root/data is non-stationary

$H_a$: variable has no unit root/data is stationary

In this paper, two 'unit root' tests have been performed on the real GDP gap data and both the unemployment rate gap data; the Augmented Dickey-Fuller test and the Phillips-Perron test, both having the same null hypothesis. The results show us that the data set of the variables (real GDP gap, unemployment gap and female unemployment gap) were found stationary in their first difference in the presence of trend and intercept.

Table 4.2a Unit Root test result (At first difference)

| Variables | ADF | PP | Order of Integration |
|---|---|---|---|
| RGDP | -5.354 | -3.566 | I (1) |
| | (0.0000) | (0.0329) | |
| UN | -3.846 | -5.314 | I (1) |
| | (0.0144) | (0.0001) | |
| UNF | -3.254 | -4.658 | I (1) |
| | (0.0029) | (0.0008) | |

Source: Author's publication, note: P values are mentioned in brackets under each test.

The t- statistic measures of all the variables are more than 5% and 10% critical values and the p-value of all the variables are less than 0.05.

The results of the Phillips-Perron test also show that there are no unit roots in the data and they are stationary as their adjusted t-statistic is greater than 5% and 10% critical values. Moreover, the p-values are also less than 0.05. Therefore, for both ADF and Phillips-Perron tests, the null hypothesis is rejected.

- *Johansen Cointegration Test*

The Johansen Cointegration test is carried out to establish whether there is any correlation between the variables in the long run. This test is carried out with the data in their level form. In this paper, I have taken all the natural log forms of the data and therefore, carried out the cointegration test in the level order even though the stationarity was found in their first difference order. The null hypothesis of this test is;

$H_{0:}$ There is no cointegrated equation

Ha: There are cointegrated equations

## V. DECISION CRITERIA

- We observe the Trace statistics and the Max-eigen statistics.
- Rejection is done at 5% level.
- If the Trace and Max statistics have a value, greater than the 5% critical value, the null hypothesis is rejected.

*Real GDP, Unemployment Rate & Female Unemployment rate*

- *Trace Result*

| Hypothesized No. of CE(s) | Eigenvalue | Trace Statistic | Critical value at 0.05 | Probability** |
|---|---|---|---|---|
| None* | 0.828368 | 51.82390 | 29.79707 | 0.0000 |
| At most 1* | 0.500913 | 20.10062 | 15.49471 | 0.0094 |
| At most 2* | 0.344087 | 7.591075 | 3.841466 | 0.0059 |
| Trace test indicates 3 cointegrating eqn(s) at 0.05 level<br>'*' denotes rejection of null hypothesis at 0.05 level<br>'**' represents McKinnon-Haug-Michelis (1999) p-values | | | | |

Table 4.2b Johansen Cointegration; Unrestricted Cointegration Rank test (Trace)

- *Max-Eigenvalue Result*

| Hypothesized No. of CE(s) | Eigenvalue | Max-Eigen statistic | Critical value at 0.05 | Probability** |
|---|---|---|---|---|
| None* | 0.828368 | 31.72328 | 21.13162 | 0.0011 |
| At most 1 | 0.500913 | 12.50955 | 14.26460 | 0.0930 |
| At most 2* | 0.344087 | 7.591075 | 3.841466 | 0.0059 |
| Max-eigenvalue test indicates 1 cointegrating eqn(s) at 0.05 level<br>'*' denotes rejection of null hypothesis<br>'**' represents McKinnon-Haug-Michelis (1999) p-values | | | | |

Table 4.2c Johansen Cointegration; Unrestricted Cointegration Rank test

In this analysis, it can be seen that for the null hypothesis which implies that there are no cointegrating equations, both Trace and Max-Eigen values exceeds the critical value at 5%. Therefore, the null hypothesis is rejected, concluding that there are cointegrated equations. The trace and max-eigenvalue tests show that there is at most one cointegrating equation and as a result, this indicates the presence of a long run relationship among the variables.

- *Ordinary Least Square (OLS) Regression*

The final stage of the data analysis is the Ordinary Least Square (OLS). The result of this regression will determine how the variables are corelated to one another.

The model for the regression is;

$$Y_{t\_}Y^* = \alpha + \beta_1 (UN_t - UN^*) + \beta_2 (UNF_t - UNF^*) + \varepsilon_t$$

Where,

Y= real GDP

UN = Unemployment rate

UNF = Female Unemployment rate

Y* = Potential output

UN* = Natural rate of unemployment

UNF* = Natural rate of female unemployment

$\beta_1$ and $\beta_2$ are the Okun's coefficients, "α" is the intercept and "ε" is the error term in the year "t".

| Variable | Coefficient | T-value | P-value |
|---|---|---|---|
| $(UN_t - UN^*)$ | -.6753979 | -2.37 | 0.031 |
| $(UNF_t - UNF^*)$ | .2931281 | 1.31 | 0.207 |
| C | -.0012026 | -0.07 | 0.946 |

Table 4.2d Ordinary Least Squares (RGDP, UN, UNF), Source: Author's computation

The regression performed, shows the real GDP of Bangladesh having a negative correlation with the overall unemployment rate with a negative Okun's coefficient, therefore, following the general law of Okun. On the other hand, the female unemployment shows a positive relationship with the economic growth of Bangladesh.

The overall model of the regression is;

$Y_t - Y^* = - .0012026 - .6753979 (UN_t - UN^*) + .2931281 (UNF_t - UNF^*) + .07563$

*Heteroscedasticity Test*

This test is performed to see whether the error term, found in our OLS regression varies with the predicting variables. Two tests have been done in this paper; the Breusch Pegan test and the White test.

The null hypothesis of this test is;

$H_0$: Variance of error term is constant

Ha: Variance is not constant

| | Breusch Pegan | White |
|---|---|---|
| P-values (at 0.05 level) | 0.4095 | 0.3999 |
| F-values | 0.94 | 0.97 |

Table 4.2e Heteroscedasticity test at 95% confidence level, Source: Author's computation

The results above show us that since the p-values are quite high (more than 0.05) for both tests, there is no joint significance and the independent or explanatory variables do not affect the variance of the error term. Therefore, the null hypothesis cannot be rejected, leading to conclude the absence of heteroscedasticity.

## VI. RESULT INTERPRETATION

The OLS regression performed, gives us a negative Okun's coefficient for the relationships between unemployment rate and the real GDP and a positive coefficient for the female unemployment with the economic growth of Bangladesh. According to the regression, when unemployment rate increases by 1%, the real GDP falls by 0.68%. On the other hand, a 1% rise in female unemployment rate increases the real GDP by 0.29%. At natural rate of unemployment, the economic growth rate is shown to fall by 0.0012%. However, unlike the unemployment gap, the P-value found for female unemployment gap, shows that the result is not statistically significant at 5% level and the R-squared value shows that both unemployment gap rates explain the situation of the economic growth of the country by around 32%. Therefore, it is deduced that the validity of Okun's law is yet a matter of further analysis in Bangladesh. A research article in 2010 has worked with other Asian countries (Pakistan, India, China, Sri Lanka), including Bangladesh, testing for Okun's law, has performed the FMOLS regression to determine the Okun's coefficient and they found negative coefficients for all of them.

However, for female unemployment, this paper shows a positive correlation with the real output gap. Therefore, the model shows that in this case, Okun's law does not apply unfortunately. A possible reason might be the presence of other factors such as gender discrimination, fertility rate, safety insecurities of working environment etc. that influence the female unemployment rate more significantly and the situation cannot be solved with the economic growth alone. In the RMG sector of Bangladesh, female labors are a dominant and can lead the economy to a new level of development. In fact, there are disappointing contradictions and uneasy situations for the female workers such as fake promises, being deprived from basic rights, targeted to exploitation etc. As the low-earning, inconvenient working conditions slow down the pace of the biggest export sector of the country, the ADB suggests to promote diversification on production in order to overcome the issues. It also believes that if the demand for female labors increase in the manufacturing and the agricultural sectors, which are still dominated by men, the exploitation problem can come to an end over time. Moreover, a study in the rural areas revealed that mobility of female is still restricted and 44% of the married working women at the age of 20-24, claim that they are not free to make their own decisions and that they require husband's permission to work outside. On the contrary, access to education in the urban areas has led to women take wise decisions such as delaying marriage and conceiving children, resulting in opening up employment opportunities for themselves. Therefore, the government should expand the education opportunities for female and thus, bring down the restriction mobility problem.

## VII. CONCLUSION & POLICY IMPLICATION

This paper has attempted to provide a robust research output of the application of Okun's law in Bangladesh. The data of annual real GDP and annual unemployment rates has been collected within the time frame of 2000-2019. The ultimate goal of this research paper has been the Okun's coefficient which has been found out in five major empirical analyses; Hodrick-Prescott (HP) filter detrending technique, Unit root tests using the Augmented Dickey Fuller (ADF) and the Phillips-Perron (PP) methods, Johansen Cointegration test, the Ordinary Least Square (OLS) regression model to have an overall idea of the relationship between the unemployment gap and output gap and the Heteroscedasticity test. Results of the analyses have come up with stationarity of the data in their first differences. The cointegration analysis gave an overall presence of a long run relationship between the variables. Finally, the regression results showed that the correlation of unemployment and output gap supports Okun's law because of the negative coefficient found and the positive correlation between the female unemployment and output gap showed that Okun's law could not be applied in this case. The variance of error term, found in the regression is not affected by the explanatory factors of economic growth, mentioned in this paper.

One of the most important issues of female unemployment, not being influenced by economic growth is the increasing rate of rape cases of the country and unsafe surroundings. The government should ensure the utmost security of women in their working places, the company must provide safe transport facilities for them (Rahman, 2010). Another major problem which especially the married women with small children face is the mismanagement between their work and their responsibilities of their children. The analyses of Rahman and Islam in 2013 along with the LFS data in the same year have deduced that small children, that need to be taken care of contribute to the low labor force participation of women. Therefore, the working places should have a daycare center in their premises so that women do not face such problems during their working hours. An overall conclusion about the entire paper is that unemployment level of Bangladesh has yet, a vague influence in the developing the economy as per its real GDP and the government should work on providing more and more job opportunities in attempt to sustain the natural rate of unemployment.

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