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An empirical study of GDP, exchange rate, inflation and unemployment in Bangladesh

Md. Sariful Islam[1], Muhammed Sahajalal[2]
[1] Independent Researcher, Daffodil International University, Dhaka, Bangladesh
[2] Economic Relations Division, Dhaka, Bangladesh

Abstract
The purpose of this study is to find out the impact of GDP growth rate; Inflation rate; Real Exchange rate and Unemployment rate in Bangladesh's Economy by considering 29 years data. This research is fundamentally quantities in nature. Only secondary data have been used for this study. The EViews 9 and the SPSS version 20 have been used to analyze the dataset. To find out the objectives of this paper by using a different test like, Descriptive statistics, Graph, Simple Regression, Anova. This research also shows that in the Unemployment rate of Bangladesh has influenced by GDP (Gross Domestic Product) growth rate, Inflation and Exchange rate. The results of this paper show that Unemployment rate of Bangladesh insignificantly negatively influence by GDP growth rate. Lastly, this paper proves that the Exchange rate and the positively affected on the unemployment rate at significant levels and the inflation rate has negative effect.

Keywords: unemployment rate, exchange rate, inflation rate, GDP growth rate**,** Avova

Introduction
Now a day's the Unemployment is one of the most popular concerns for a country. The unemployment rate has tremendous influence in the development of the economies of each country. Okun's law (1962) has shown that if 1 % increases of unemployment rate than 2 % potential GDP can be decreased. Gross Domestic Product (GDP) growth rate is one of the most important macroeconomic variable that representing the country's overall economic condition. There are lots of factors works behind the expansion of GDP growth rate. The Unemployment rate can be affected by the Inflation rate. The relation between unemployment rate and inflation rate is inverse that founded from the studies of Phillips Curve. The Real Exchange Rate is another considerable macroeconomic factor for a country's economy. The real exchange rate is playing a crucial function in the development of economic growth. Hence the real exchange rate can easily effect on the unemployment rate for every country's economy. The relationship between the real exchange rate and the unemployment rate is positive.

Literature Review
Kaur (2014) [1] examined the relationship between unemployment rate, inflation rate, exchange rate and GDP growth rate during the 1990 to 2013 in India. This paper illustrates that the Exchange rate and the Inflation rate are significantly affected by the Unemployment rate in India.
Sanchez & Liborio (2012) [3] scrutinized that recently, the relationship between Unemployment rate and Gross Domestic Product (GDP) growth rate has been changed. Their paper also shows now a day the ratio between populations of employment in the unemployment rate has been dramatically changed.
He, X. (2013) [4] observes that the relation between the Real Exchange rate and the Unemployment rate in several countries for the year of 1994 to 2009. His paper explains that most of the countries have a negative relation between unemployment rate and the real exchange rate although a few countries have a less negative relationship between those variables like, the Netherlands; Hong Kong and Singapore.
Touny (2013) [2] examined that in the long run inflation rate of Egypt would fail to reduce Unemployment rate during the year 1974-2011.
Ayyoub, Chaudhry & Farooq (2011) [5] found that the rate of inflation in Pakistan has momentous negative impact on Economic growth. Their paper suggested the policy maker of Pakistan should be keeping its inflation below 7% level.

Objectives
The objectives of this paper is follows:
- To examine how the impact of the inflation rate affects the unemployment rate in the economy of Bangladesh;
- To find out the impact of GDP growth rate on the unemployment rate in Bangladesh Economy;
- To analyze the impact of exchange rate on the unemployment rate in Bangladesh Economy.

Methodology
Sources of Data
This paper fully based on secondary data. This paper didn't attempt to deal with any primary sources for data collection. For collecting data, the researchers have followed their own judgmental approach. All types of data have been collected from different sources like World Bank Indicator, Bangladesh Bureau of Statistics, Bangladesh Bank report, International Monetary Fund, different journal, etc. For collection of data they have used 1990-2018 period of time.

Tools & Techniques
To find out paper objectives this paper has used the Statistical Package for Social Science (SPSS) version 20. This paper used Descriptive statistics, Ordinary Lest Square and Regression test. Gross Domestic Product (GDP), Inflation rate (Inf), Exchange Rate (Ex), Unemployment

Rate (Un) is representing the macroeconomic variable factor. Linear Regression model is,

$$Un = \beta_0 + \beta_1 GDP + \beta_2 Inf + \beta_3 Ex + \epsilon$$

Where
Un= Unemployment Rate
Inf = Inflation Rate
GDP= Growth Rate of GDP
EX – Exchange Rate.
In this model β_1, β_2, and β_3 are the coefficient of all those independent variables. In this model $\epsilon$is representing the error term occurrence and $\beta_0$is the y-intercept. This paper has been conducted in this following hypothesis.

H_0= GDP has no significant impact on Unemployment in Bangladesh.
H_1= GDP has significant impact on Unemployment in Bangladesh**.**
H_0= Inflation Rate has no significant impact on Unemployment in Bangladesh.
H_2= Inflation Rate has significant impact on Unemployment in Bangladesh.
H_0= Exchange Rate has no significant impact on Unemployment in Bangladesh.
H_3= Exchange Rate has significant impact on Unemployment in Bangladesh.

Discussion & Analysis

Table 1: Descriptive Statistics

	GDP	INF	Excnahge	Unemploy
Mean	5.5696	6.4006	59.9844	3.5472
Median	5.4400	6.1500	59.5100	3.5600
Maximum	7.8600	10.7000	83.9000	5.0000
Minimum	3.4900	1.9100	34.5700	2.1900
Std. Dev.	1.1207	2.4331	16.1432	0.8460
Skewness	0.0800	-0.0621	-0.0918	-0.2046
Kurtosis	2.2289	2.2516	1.5990	1.7116
Jarque-Bera	0.7493	0.6954	2.4124	2.2081
Probability	0.6875	0.7063	0.2993	0.3315
Sum	161.5200	185.6200	1739.550	102.8700
Sum Sq. Dev.	35.1691	165.7652	7296.891	20.0407
Observations	29	29	29	29

***Source*:** Estimated Output of EVews 9.

Table 1 representing the descriptive statistics for this paper.

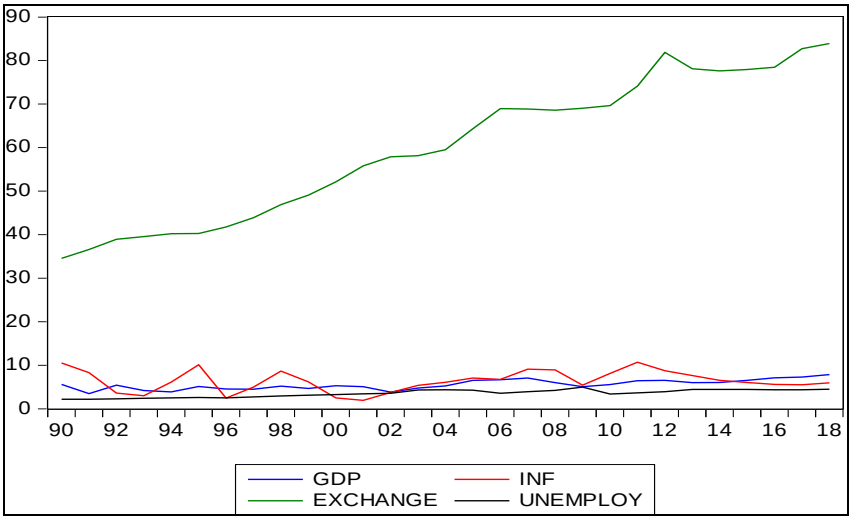

Fig 1: Trend of GDP growth rate, Inflation, Exchange rate and Unemployment rate in Bangladesh: 1971-2018

Table 2: Regression

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.218	.395		3.081	.005
	GDP Growth rate	-.025	.033	-.073	-.764	.452
	Inflation rate	-.137	.114	-.182	-1.199	.242
	Exchange rate	.054	.008	1.035	7.074	.000

a. Dependent Variable: Unemployment rate
***Source*:** Estimated.

Table 2 is showing the output of Regression analysis. In Bangladesh economy GDP growth rate has negative impact on Unemployment rate over the period of 1971 to 2018 and this is not statistically significance. Here Exchange rate (.054) has positive impact on Unemployment rate & this is statistically significant at 5% significance level. Inflation rate (-.137) has negative impact on Unemployment rate over the study period & this isn't statistically significance at 5 % significance level.
So the Regression Model is follows;

$$Un = 1.218 - .025GDP - .137Inf + .054Ex + \epsilon$$

Table 3: Model Summary

Model Summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.893[a]	.798	.774	.40235

a. Predictors: (Constant), Exchange rate, GDP Growth rate, Inflation rate

From table 3 it is been found for this model R Square vale is .893. This R Square value indicate that this model is well fit to the data. R Square value describe that 89 % of variation in dependent variable in Unemployment rate is due to Independent variables

Table 4: Anova Result

ANOVA[b]						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	15.994	3	5.331	32.933	.000[a]
	Residual	4.047	25	.162		
	Total	20.041	28			

a. Predictors: (Constant), Exchange rate, GDP Growth rate, Inflation rate
b. Dependent Variable: Unemployment rate

Table 4 is representing the result of the Anova. Here F - value is 32.933, this value is statistically significance at 5% significance level. From F value it can be said that R Square is statistically significance, which means that in paper the impact of independent variables on dependent variable is significant. So after lots of analysis it can be said that for this paper model is significance.

Finding

After study it has been found that in Bangladesh Economy during the year 1971-2018, there has relationship between Gross Domestic Product (GDP) growth rate, Inflation rate, Real Exchange rate and the Unemployment rate. Here the Unemployment rate insignificantly negatively influence by GDP growth rate. This paper shows that Exchange rate has positively impacted on unemployment rate, it has statistically significant impact. Inflation rate has negative impact on the Unemployment rate and that impact is not statistically significance at 5% significance level.

Conclusion

Bangladesh has satisfied the entitlement criteria set by the United Nations (UN) to be renowned as a developing country, crossing over from the roll of least developed countries (LDCs). Day by day its economy is expanding. Not only Bangladesh economy but also world economy is greatly influenced by macroeconomic variables. This paper has shown lots of new findings that will help to policy maker in Bangladesh Economy for their effective decision making. This paper has faced batches of limitations during the study epoch. This paper has shown different types of findings so from here has lots of scope for further research.

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