Impact Of Economic Growth, Fdi, Industry And Age Dependency Ratio On Unemployment In Bangladesh

Sabiha Binta Hasan
Assistant Professor
Department Of Economics
Mawlana Bhashani Science And Technology University
Tangail, Bangladesh.

Abstract
Unemployment is one of the common problems all over the world. It is the most important macroeconomic indicators in economics. Now unemployment is not only the concerning issue in the developing countries like Bangladesh but also the developed countries as well. Various factors like economic growth, population growth, age dependency ratio, gender, industry and education helps to determined unemployment in Bangladesh. This study examines the effects of industry, age dependency ratio, foreign direct investment, and economic growth on unemployment in Bangladesh. Data for this study was gathered from the World Development Indicator (WDI), which takes the years 2010 to 2021 into account. Economic growth, foreign direct investment, industry, and age dependency ratio are used as dependent variables, and unemployment is used as an explanatory variable. Simple descriptive statistics and Ordinary Least Squares (OLS) are applied in this study and used STATA software for empirical results. Unemployment and economic growth are adversely connected, according to the OLS result. The fact that economic expansion significantly worsens unemployment in Bangladesh supports the applicability of Okun's law there. Bangladesh's unemployment is significantly reduced by FDI (outflow), which is beneficial. On the other hand, unemployment is significantly impacted negatively by industry and age dependence ratio. The R-square is approximately 0.9441, or 94.41%, indicating that the model fits the data well. The whole model is significant, as shown by the F- statistics. This model is free from heteroscedasticity, normality, autocorrelation, and model specification problems, according to diagnostic test results from the Breusch-pagan-Godfrey, Jarque-Bera, Durbin-Watson, and Ramsey RESET tests
Keywords: *Age dependency ratio, Economic growth, industry, OLS, Okun's Law, Unemployment, FDI outflow, Bangladesh.*

I.   INTRODUCTION

Background of the study

Although being in development, Bangladesh has a large population. The majority of the world's countries today face one or more threats, including unemployment. Bangladesh's biggest issue is unemployment. Unemployment is the state that people are in when they are actively looking for work but are unsuccessful. Calculating the unemployment rate involves dividing the entire population of a nation by the number of unemployed citizens living there.

International Labor Organization (ILO) defines unemployment as if they do not have a job, have actively looked for work in the prior 4 weeks, and are currently available for work. An important point to note is that unemployment requires more than being without a job- it requires taking steps to find a job. Some of the common reasons of unemployment in Bangladesh and other developing economics are the technological changes, demographic structure, economic conditions, imbalance between demand and supply of manpower, overproduction, defective education system, lack of investment from Govt., unequal labor force and immigration from rural areas towards towns and cities.

The loss of human resources, thievery, terrorism, mental illnesses including depression, and murder are all caused by unemployment (Murugan , 2013). Unemployment is typically divided into three types: cyclical, structural, and frictional unemployment. When there is no cyclical unemployment, natural unemployment is the unemployment that results from structural change and fictions. The natural rate of unemployment is thought to be between 3% and 5% globally . It might be argued that an economy does not have a problem with unemployment if the unemployment rate is between 3% and 5%. According to classical economics, everyone who wants to work can find a job paying the going rate, making unemployment choice. Yet, Keynes defined unemployment as the inability to find a job.

Generally, unemployment simultaneously increases in both developed and developing countries. To maintain sustainable economic growth, any government of any nation will always try to control their nation's price stability and reduce unemployment by employing sound macroeconomic policy.

Objectives of the study:
Economic growth rate, FDI and industry are the most important macro -economic indicator to determine unemployment. The key objectives of this study are:
(1)To find out the impact of economic growth rate on unemployment.
(2)To check out the impact of FDI on unemployment.
(3)To find out the impact of industry, age dependency ratio on unemployment
(4)To recommendation some important policy about economic growth rate, FDI , industry and unemployment.

II. LITERATURE REVIEW

Many studies have been conducted at the national and international levels to determine the effects of macroeconomic factors, including economic growth, inflation, population growth, foreign direct investment, etc. on unemployment. An effort has been made to create an overview of the literature in using information obtained from existing works.

Mehrnoosh Mohseni and Feizolah Jouzaryan (2015) examines the impact of unemployment and inflation on Iran's economy. Data from time series spanning the years 1996 to 2012 were utilized. This study examines the short- and long-term impacts of inflation and unemployment on economic growth using the Autoregressive Distributed Lag (ARDL) model. The result shows that unemployment and inflation have a significant and negative long-term influence on economic growth. According to the article in this issue, the government should develop policies to reduce and keep unemployment and inflation under control.

Rubaiya Tanha (2018) investigated the effect of inflation and economic growth on unemployment in Bangladesh. In this analysis, the authors examined time series data spanning the years 1991 and 2015. The study's explanatory and dependent variables, respectively, are economic growth, inflation, industry, age dependency ratio, and unemployment. In this study, the Augmented Dickey-Fuller test, the OLS method, and straightforward descriptive statistics were all used. Because all of the variables are level and steady, the Augmented Dickey-Fuller test found no evidence of a unit problem. Economic growth has a minor favorable impact on unemployment, according to the OLS estimator, finding that Okun's law is inaccurate. It demonstrates that unemployment is adversely affected by both industry and inflation impact. It is revealed that the correlation between joblessness and age dependency is statistically inversely significant.

Muhammad Ramzan (2021) found the influence of inflation and unemployment on the economic growth of Pakistan .The OLS method is implemented in this study, and data from 1980 to 2018 are gathered. The researcher ran ADF on an error term to examine co-integration. Because the t-statistics are more than the t-tab sig value and are significant, the result suggested that the time series is stationary. The significance of the error term on ADF ensures that there will be long-term connection. According to the OLS results, both unemployment and inflation are statistically insignificant, as well as the entire model. The ECM result demonstrates that unemployment and inflation are outside of the range of equilibrium. According to the "Granger causality test," there was a bi-directional relationship between GDP and inflation, but not between unemployment.

Moses K Macharia and Aggrey Otieno (2015) examined the impact of inflation on joblessness in Kenya. This paper used a cointegration methodology to determine the cause-and-effect relationship between the variables. In this study, unemployment is the dependent variable, with lag values from 1963 to 2015, and inflation is the explanatory variable. The study finds that the inflation rate significantly worsens unemployment over the long and short durations. According to the study's findings, Kenya does not follow the Philips Curve theory. According to the report, the government should create policies that help ensure a low rate of inflation in the country in order to achieve the lowest levels of unemployment.

Suna Korkmaz and Muzhgan abdullazade (2020) conducted utilizing data from the years 2009 through 2017, a panel causality test was used to examine the relationship between the inflation rate and unemployment in nine randomly chosen G6 nations (Australia, Brazil, Canada, France, Germany, Italy, The Russian Federation, Turkey, and U.K.). The Granger causality test demonstrates that the unemployment rate and inflation have a one-way causal relationship. According to the findings, these countries' top priority right now is probably managing inflation.

Fuad M. Kreishan (2011) enforces The Okun Law was passed in Jordan to look into the relationship between joblessness and economic expansion. In this analysis, time series data from 1970 to 2008 were used. The study used the Augmented Dickey-Fuller (ADF) test for the unit root, cointegration test, and a simple regression between unemployment and economic growth. The results demonstrate that Jordan is unable to

validate Okun's law. According to the analysis, economic measures in Jordan focusing on structural change and labor market reform would benefit policymakers more.

Chowdhury and Hossain (2014) studied have shown that unemployment has a significant role in the underutilization of human capital, which is the development of economics. In this paper, they investigated at macroeconomic factors affecting Bangladesh's unemployment rate from 2000 to 2011. They used SSERM, or Simple Single Equation Regression Model, to look into the causes of unemployment. The unemployment rate served as the dependent variable for this study, whereas GDP growth, exchange rates, and inflation rate (based on the CPI) served as the explanatory variables. The study's findings indicated that inflation had a favorable effect on unemployment while GDP growth and exchange rates had the opposite effect. They recommended that policymakers create income distribution in order to improve the impact of growth on the employment rate.

Janifar Alam, Quazi Nur Alam and Md. Tanvirul Hoque (2020) investigated the effects of various key macroeconomic variables on Bangladesh's rising jobless rate. For this study, the unemployment data set serves as the dependent variable, while the GDP, inflation, population growth, and FDI data sets serve as the explanatory variables for the years 1995 to 2019. The Augmented Dickey-Fuller test for unit root was employed in this study to determine whether or not variables are stationary. There is a long-term association between the factors and unemployment in Bangladesh, according to the Augmented Dickey Fuller test, collinearity and cointegration test, and least square approach. The Granger causality test indicates that the unemployment rate has a one-way impact on economic indicators as well.

Kazi Mohammed Kamal Uddin (2022) examined to evaluate the factors that affect economic growth and examine the factors that determine unemployment. There are two sections, such as examining the factors that influence unemployment and determining their effects on economic growth using statistical and econometric models. The outcome demonstrates that factors influencing unemployment as well as important macroeconomic variables including LNCAPF, LNINDD, LNREME, LNTOP, and LNFDI have a favorable impact on economic growth. The long-term relationship between the variables is demonstrated by the ARDL bound test. Causality analysis explains that other variables are also measured by causal links, such as the bidirectional causality between employment opportunity and FDI and the unidirectional causality between industrialization and economic growth.

Michael, Atuma Emeka and Emmanuel (2016) conducted The relationship between unemployment and economic growth in Nigeria's economy between 1980 and 2013. In this investigation, the Granger causality test, the Vector Error Correction Model (VECM) method, and the cointegration test were all used. Here, the unemployment rate and private consumer spending are the explanatory variables, and real gross domestic product (RGDP) is the dependent variable. According to the findings of the stationarity test, all variables except for unemployment were stationary at level; unemployment, however, started to become stationary at the first difference. The outcome of cointegration demonstrates the variables' long-term interdependence. According to the VECEM research, unemployment significantly lowers RGDP. Needless to mention, a one-way relationship between real GDP and unemployment was revealed by the Granger causality test.

Khaled Mohammed Al-Swaie (2020) examining the relationship between economic development and unemployment in Jordan from 1976 to 2018. The relationship between them was determined using the ARDL cointegration analysis. The findings indicated a negative correlation between unemployment and real GDP, which is in accordance with Okun's law. In order to establish bidirectional causation, we were also able to determine the direction of the relationship between real GDP and unemployment in both the long and short terms.

Riaz and Zafar (2018) explores the variables that affect Pakistan's unemployment rate. The information is gathered from secondary sources and spans the years 1990 to 2015. This study makes use of the ARDL technique. GDP, population, enrollment in degree-granting institutions and universities, technical and vocational education are the independent variable and unemployment is the dependent variable in this study. According to the ARDL results, there is a negative correlation between GDP and unemployment. In Pakistan, the population has positive significant and technical and vocational education has positive and insignificant relationships with unemployment. At a 5% level of significance, the CUSUM and CUSUMQ results show that the model is statistically stable within a crucial constraint.

Ladislav, Tibor ,Adam Kovacs Eva Baloghova (2020) analyzing the progression of the unemployment rate is crucial for understanding the prospects for the economy in the future. This study examines the investigation of the unemployment rate in the V4 nations of Central Europe. It focuses on analyzing how the local long-term unemployment rate and the economic cycle are related .

They aimed to look at the population's productive age range (20-64 years). The development of job patterns is largely influenced by this group. They used the OLS method and the result implies that there is no relationship between unemployment and real GDP .

III. Research Methodology

From the literature review it is founded that unemployment has significant impact on economic growth , population growth, inflation ,investment and industry .This section of the study describes the methods, purpose and find out the objectives of this paper . In this part of the study, I have tried to describe the source of data and what kind of data and econometric methods are used for computing the impact of economic growth, FDI , industry and age dependency ratio on unemployment in Bangladesh .

(a) Determinants of the regression model

Regression model is concerned with the study of the dependence of one variable on one or more other variables. The simple linear regression model is demonstrated in this study is shown below:

$Y = B_1 + B_2 X + U_t$

Where, Y denotes the unemployment rate and it is a constant dependent variable. B_1 is the intercept term. It gives the mean or average effect on Y, if all the variables excluded from the model .B_2 is the coefficient of the explanatory variables. B_2 measures the change in the mean value of Y, per unit change in X. X denotes the explanatory variables. U_t is the stochastic disturbance or error term .

Specification of the model

By resorting the above model , the equation for this study appear as follows:

UNEMP = f (GROWTH ,FDI, IND, AGEDEP)

$UNEMP_t = B_1 + B_2 GROWTH_t + B_3 FDI_t + B_4 IND_t + B_5 AGEDEP_t + U_t$

Where ,

UNEMP = unemployment rate

GROWTH = GDP per capita growth (annual %)

FDI = Foreign Direct Investment , net outflow, (% of GDP)

IND = Industry , value added, (% of GDP)

AGEDEP = Age dependency ratio , (% of working age population)

B_1 = Intercept term

B_2 , B_3 , B_4 , B_5 = Partial regression coefficient

t = time period (2010-2021)

U = Error term

Hypothesis

H1 : GDP is negatively related with unemployment

H2 : FDI is negatively related with unemployment

H3 : Industry is negatively related with unemployment

H4 : age dependency ratio is negatively related with unemployment

The hypotheses regarding the signs of the explanatory variables are given below,

(a) According to the Okun's law the relationship between unemployment and economic growth is negative. Generally, faster economic growth lowers unemployment whereas slower economic growth increases unemployment.

(b) FDI is an important indicator to determine unemployment. FDI Outflow means the outward direct investment by the residents of the reporting economy to external economy. Thus it decreases the share of GDP and increases unemployment.

(c)Industrial sector creates job opportunities for unemployed people. If a country has more industrial sector, then it will reduce its unemployment problem more easily.

(d)Higher dependency ratio creates burden the potential labor force and therefore they actively searching a job to support the dependents and its lead to reduce the unemployment rate.

Selections of variables and data

There are five variables used for this study. Unemployment is taken as a dependent variable and economic growth , FDI, age dependency ratio , industry are taken as an independent variables. Time series data are used for this study. The data used in this study are collected from secondary source (World Development Indicator) and gathered from the period of 2010- 2021. Secondary source provide second -hand information and commentary from other researchers. Secondary data refers to the data that is collected by someone other than the primary user.

The data for age dependency ratio (hereinafter AGEDEP) (% of working age population), industry (hereinafter IND) value added, (% of GDP), economic growth (hereinafter GDP) as GDP per capita growth (annual %), and unemployment (hereinafter UNEMP) as percentage of the total labor force estimated by the International Labor Organization (ILO) are taken from the World Development Indicator (WDI).

Estimation technique

For the investigation, the model first employed descriptive statistics. Using Ordinary Least Square (OLS) methods, the effect of economic growth, FDI, industry, and age dependency ratio on unemployment is assessed. The significance of the results is then determined using a t-test. Since we use time series data it is necessary to checked out unit root and co-integration. But the sample size is too small to test unit root as well as integration. So unit root and co-integration test are not taken into account in this paper. We use the STATA software to show the impact of economic growth, FDI, industry and age dependency ratio on unemployment in Bangladesh.

The method of Ordinary Least Squares (OLS)

The method of ordinary least squares is assigned by Carl Friedrich Gauss, a German mathematician. It is the cornerstone of econometric theory. It is the most powerful and popular methods in regression analysis. It is a statistical technique that used to find out the best -fitting line for a set of data, to estimate the unknown parameters in a regression model. The method relies on minimizing sum of residual squares between the actual and estimated values. This method has several assumptions that make it more interesting to use and produce modest results.

Diagnostic checking

After regression analysis several diagnostic checking test have to be performed.

Multi-collinearity Test

Multi-collinearity is a statistical concept between explanatory variables in a regression model. It refers to perfect or exact relationship among some or all explanatory variables of a regression model. For checking multi-collinearity we used **Variance Inflation Factor (VIF)** test.

Heteroscedasticity Test

In the presence of heteroscedasticity, although we will get unbiased and consistent estimator but the estimator does not have minimum or efficient variance , which violate the properties of BLUE .In order to determine heteroscedasticity in a linear regression model, one uses the **Breusch-Pagan-Godfrey test.**

Autocorrelation Test

Autocorrelation is a mathematical representation. It occurs when a variable are correlated with its previous or lagged version and has an impact on the next period in time series data. Autocorrelation is also known as serial correlation. In this regression analysis **Durbin Watson statistics** are used for checking serial correlation.

Normality Test

Normality is a statistical concept. It will help to determine whether the data are normally distributed or not. Skewness and kurtosis is a measure used to determine normal distribution. There are many test for normality. In this study **Jarque - Bera normality test** is used.

Test for Model Specification

A regression model has to be well - specified. Model specification helps to determine which explanatory variables should be included in or omitted from a regression model.

The Ramsey RESET test has been used to check out the model specification in this paper. It checks out the omitted variables that are important for that regression but not included in the model.

IV.   Result Analysis

Descriptive analysis

Using both recent and historical data, descriptive analysis seeks out patterns and connections .In our study we want to monitor this connection. Here independent variables are economic growth, FDI, industry and age dependency ratio. First, we analyze the connection between economic growth and foreign direct investment outflow. Economic growth and FDI outflow has a close connection. Because outflow means movement of assets out of a country. So more the outflow of asset of a country its contribution to economic development decreases. That means it reduces production, investment employment and overall economic growth .The relationship between economic growth and FDI outflow is shown the following figure:

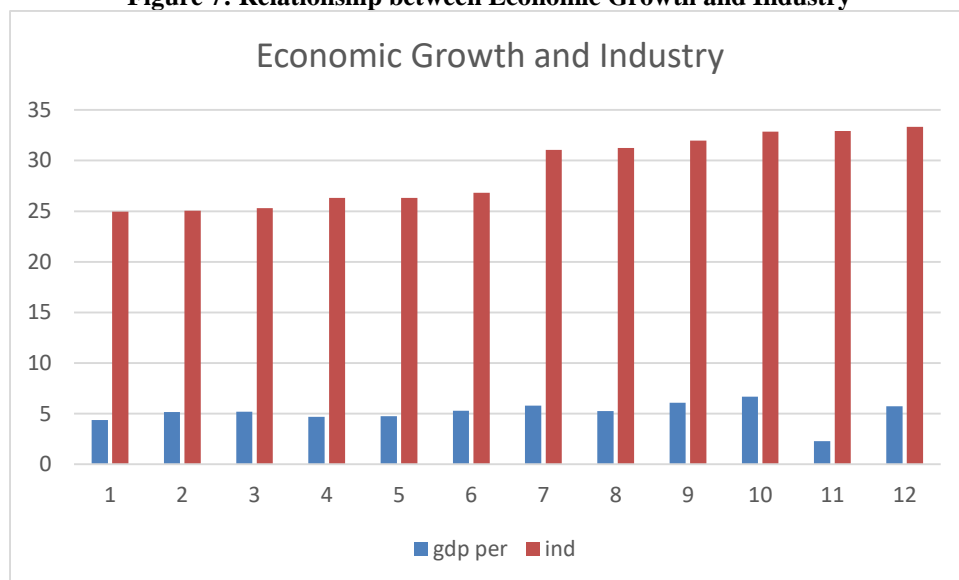**Figure 6: Relationship between Economic Growth and FDI outflow**
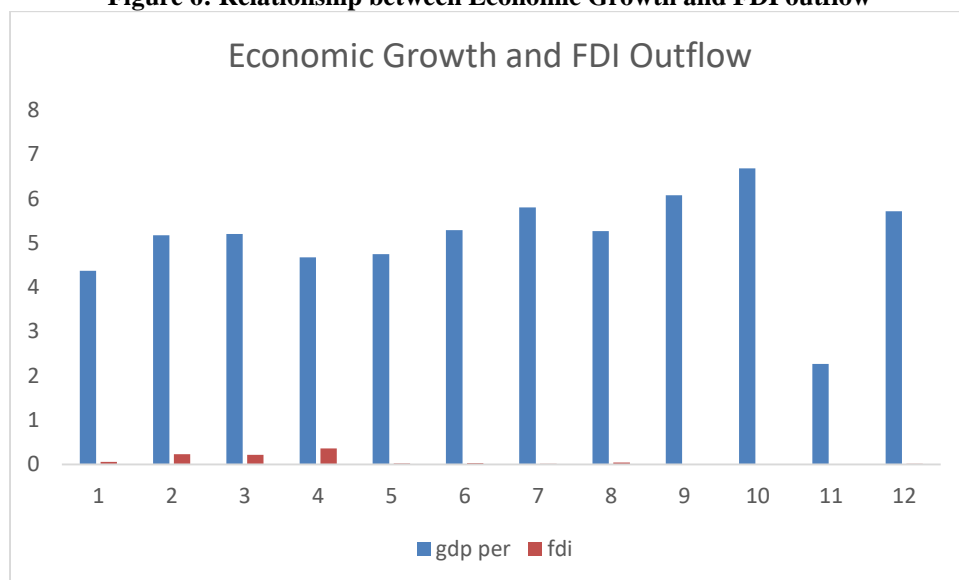
Source: World development Indicator (WDI)

Figure 6 shows the connection between economic growth and FDI outflow .From the graph it is clear that economic growth is much than FDI outflow in Bangladesh.

Economic growth and industry are also related because industry creates job opportunities. If a country has more industry then it will create more job opportunities. More employment opportunities mean unemployed workers are starting to involve in job market and they are become employed .Figure 1.7 shows the connection between economic growth and industry:

**Figure 7: Relationship between Economic Growth and Industry**

Source: World Development Indicator (WDI)

Figure 7 illustrates the relationship between economic growth and industry .For Bangladesh industrial growth is far higher than economic growth .Industry grows at an increasing rate while economic growth fluctuates over the period from 2010-2021 .

Age dependency ratio and industry has a close connection .Age dependency ratio means the dependent people rely on employed people .They become a burden for employed people and gives pressure on them . So, people seeking more job opportunities and it is the industry which provides these services.

Figure 8: Relationship between Age Dependency Ratio and Industry
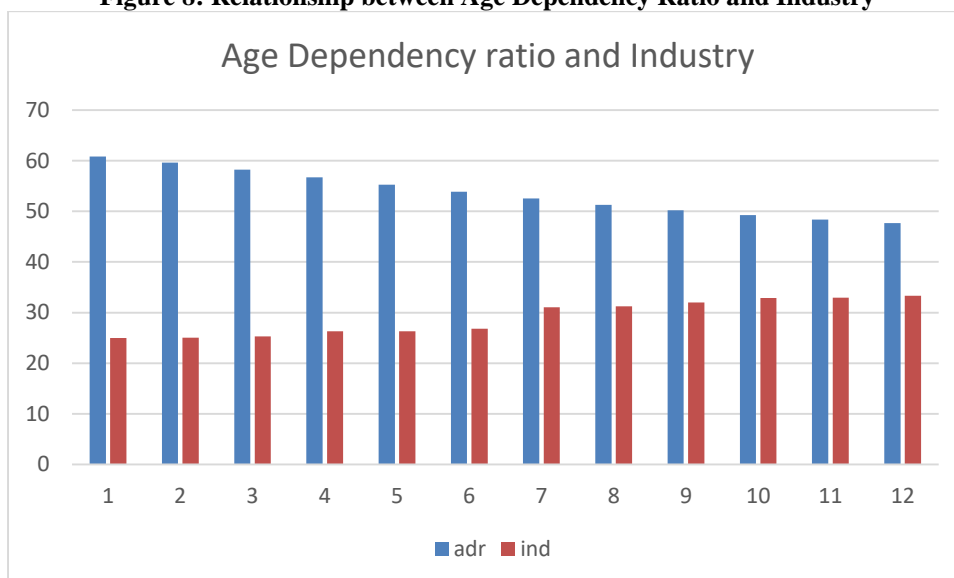
Source: World Development Indicator (WDI)

From the figure 1.8 we can see the relationship between age dependency ratio and industry . It shows that industrial growth is lower than age dependency ratio. Age dependency ratio shows a decreasing and industry shows an increasing trend.

Data Analysis and Discussion of Empirical Result

The empirical outcome of the linear regression model and descriptive statistics is illustrated below using STATA software:

Descriptive Statistics

Descriptive statistics is a quantitative analysis. It describes the fundamental properties of the sample data. Here descriptive analysis has been done with total 12 observations for each variable.

Table 4.2.1 Descriptive Statistics

Variable	Obs	Mean	Std.Dev.	Min	Max
UNEMP	12	4.388583	.5422322	3.38	5.413
GROWTH	12	5.10799	1.098276	2.271105	6.687663
FDI (outflow)	12	.0840011	.1190295	.0012858	.3646077
IND	12	29.01181	3.461399	24.95648	33.31609
AGEDEP	12	53.65555	4.48801	47.66707	60.8463

Source : Authors Calculation

Table 4.2.1 shows the descriptive statistics of the dependent variable (UNEMP) and explanatory variables (GROWTH ,FDI ,IND ,AGEDEP) . It demonstrates that unemployment has a little gap between its maximum and minimum value during this study . The mean value of unemployment is 4.388583 . It shows that Economic growth has a large gap between its between minimum and maximum values for industry, age dependency ratio is too large for this study. This lead maximum and minimum value , which indicates an unstable economic growth . The mean value for economic growth is 5.10799. FDI shows a little deviation or gap. It is found that the gap to inconsistent result for them. The mean values for FDI, industry, age dependency ratio are .0840011, 29.01181, and 53.65555 respectively.

Regression Analysis

The result of the regression analysis is shown in the table below. Time series data with 12 observations is included in the model and OLS is applied in this study.

Table 4.2.2 Regression Result

Regression Method : Ordinary Least Squares
Time series data with observation : 12
Sample : 2010-2021

Independent variable	Coefficient	Std .Err.	t-statistics	P-value
Dependent Variable : Unemployment				
GROWTH	- .1641158	.0448457	-3.66	0.008***
FDI	1.369057	.527781	2.59	0.036**
IND	-.1022222	.0497219	-2.06	0.079*
AGEDEP	-.2055724	.0338244	-5.38	0.001***
Cons	19.10764	3.417132	5.59	0.001***

R -Squared		0.9441
Adj R-squared		0.9121
F - statistics (4,7)		29.55
Prob (F- statistics)		0.0002

*** p<0.01 ,** p<0.05 , * p < 0.1
Source : Authors Calculation

The equation for the linear regression model is as follows:
$UNEMP_t = 19.10764 - .1641158\ GROWTH_t + 1.369057\ FDI_t - .1022222\ IND_t - .2055724\ AGEDEP_t + U_t$

Table 4.2.2 shows the regression result for this paper. The intercept or constant value for unemployment is 19.10764. It explains that if all the explanatory variables of the model are constant, then unemployment will be 19.10764.

The partial slope coefficient value for economic growth is -.1641158 determines a negative relationship between unemployment and economic growth .The t- statistics is exceed 2 at less than 5% significance level, so it is statistically significant . It proves that, with all other factors held equal, a one unit increase in economic growth results in a.1641158 unit drop in unemployment. The opposing relationship between unemployment and economic growth, according to Okun's law, remains true for Bangladesh, it can be concluded.

The coefficient value of FDI (outflow) is 1.369057 expressing a positive relationship between FDI(outflow) and unemployment , it is statistically significant because t- statistics exceed 2 and less than 5% level of significance. The findings exhibit that holding all other variables constant, a one unit increase in FDI (outflow) leads to 1.369057 unit increase in unemployment in Bangladesh .

The slope coefficient value of industry is - .1022222 shows a negative impact on unemployment in Bangladesh. The variable is significant as the probability value is 0.079 which is greater than 0.05 but very close to 0.05 and t -statistic shows a value 2.06 which is greater than 2, so we conclude that industrial sector has significant negative relationship with unemployment in Bangladesh. Holding all other variable constant, if industrial growth goes up by one unit , on average , unemployment goes down by .1022222 unit .

Age dependence ratio has a negative correlation with unemployment in Bangladesh, according to the coefficient value, and the value of the t statistic is approximately 5.38, making it statistically significant. It illustrates that a.2055724 unit decrease in unemployment results from a one unit increase in Bangladesh's age dependency ratio while holding all other variables constant. The R^2 value is about 0.9441 or 94.41% represent that about 94.41% variation or deviation in unemployment can be explained by the independent variables (economic growth , FDI , industry, age dependency ratio) .

The F-statistics displays a model's overall significance. In this study prob > F =0.0002 , that is less than 5% significance level . So , finally it can be decided that the overall model is statistically significant .

Result of Diagnostic Checking Test

To investigate the accuracy of our regression model , several diagnostic test are needed to be conducted . Some of the diagnostic test which has been performed in this study are discussed below :

(a) Heteroscedasticity Test : Breusch -Pagan -Godfrey

For investigating whether the variances of the error term is homoscedastic or heteroscedastic , the Breusch – Pagan -Godfrey test is used in the regression model . Hypothesis for this test is represent below :
H_0 :The variances of the residuals are homoscedastic
H_1: The variances of the residuals are heteroscedastic

Table 4.3.1 The BPG test for heteroscedasticity

Breusch -pagan- Godfrey test	
Chi^2	0.95
Prob> chi^2	0.3296

Source : Authors calculation

Here the probability value is 0.3296 which is greater than 0.05 (5% significance level) that means we cannot reject the null hypothesis, and it is accepted . So, the model is homoscedastic and it is free from heteroscedasticity.

(b) Serial Correlation Test

Durbin -Watson d statistics are run for checking autocorrelation in this study. The result of this test is given below:

Table 4.3.2 Durbin -Watson Test

Durbin -Watson d -statistics (5, 12)	1.971521

Source : Authors calculation

The Durbin -Watson d statistics value is 1.97 , which is close to 2 . If the test result is 2 or close to 2 , then there is no serial correlation issue. So it can be concluded that the model is free from autocorrelation .

(c) Normality test

For checking normality Jarque -Bera test is applied in this study .The hypothesis are :

H_0 : The residual is normally distributed

H_1 : The residual is not normally distributed

Table 4.3.3 Jarque -Bera Normality Test

Jarque – Bera Normality Test	
Variable	residuals
Observation	12
Skewness	0.3884
Kurtosis	0.984
Jarque- Bera	0.6199
Probability	0.6683

Source : Authors calculation

Here , P value is 0.6683 which is greater than 0.05 or 5% significant level . So we cannot reject the null hypothesis. That means we accept the null hypothesis that the residuals is normally distributed .

(d) Multicollinearity Test

Many economists have noticed that multicollinearity problem does not effect on the model's overall productive power , it only affects Computations associated with predictors . For checking multicollinearity variance inflation factor and coefficient of correlation has been applied in this study.

Table 4.3.4 Variance Inflation Factor (VIF) Test

Variables	VIF	1/VIF
GROWTH	12.61	0.079289
FDI(outflow)	12.54	0.079722
IND	1.68	0.595107
AGEDEP	1.03	0.968160
Mean VIF	6.97	

Source : Authors calculation

In the presence of multicollinearity the value of the VIF test is exceed 10 , but the above table the VIF mean value is about 6.97 , that is less than 10 . So, according to VIF test our regression model is free from multicollinearity .

Table 4.3.5 Correlation Matrix for Multicollinearity

UNEMP	GROWTH	FDI	IND	AGEDEP
UNEMP	1.0000			
GROWTH	- 0.2548	1.0000		
FDI	- 0.3320	- 0.0897	1.0000	
IND	0.7382	0.1527	- 0.6288	1.0000
AGEDEP	- 0.8468	- 0.1200	0.6304	- 0.9583	1.0000

Source : Authors calculation

Multicollinearity indicates linear association between two variables with each other . From the above table we can see that the correlation between unemployment and economic growth is negative and it is about - 0.2548 . The table also demonstrates that the very strong

correlation exist not only between age dependency ratio and unemployment but also industry and age dependency ratio , which exceed the value of 0.8 . But the R^2 value is significant and the VIF value also shows that age dependency ratio has significant impact on unemployment in Bangladesh .

(e) Test for Model Specification

For checking whether the model is correctly specified or not , Ramsey Regression Specification Error Test (RESET) has been used in this study . The hypothesis test are discuss below :

H_0: The model is correctly specified

H_1: The model is not correctly specified

Table 4.3.6 Ramsey RESET Test

Variable	df	probability
F – statistics	(3, 4)	0.5028

Source : Authors calculation

Here probability (F-statistics) is 0.5028 or 50.28%, Which is greater than 0.05 or 5% significance level . So we cannot reject the null hypothesis that means we have to accept it. Finally, it can be concluded that the model is correctly specified.

Overall Limitations of the Analysis

Because of restricted time and resources, limited data are used for this research. Data are collected from secondary source ,due to secondary source there is a possibility of lack of accuracy ,relevance ; and biasness also appear . More variables can be added in this analysis like qualification ,wages, population growth ,gender etc. If these variables include in this study, then it helps to give more authentic result and determine the real cause of unemployment in Bangladesh .This research can also be done in other countries. Slight multicollinearity problem also arise in this study .

V. Policy Recommendation and Conclusion

Policy Recommendation

Using the information gathered in this research, several recommendations can be made according to the authors' own work.

(i) Expansion of economic growth :

The study discovered a significant inverse relationship between unemployment and economic growth, which is desirable for Bangladesh. By implementing policies that improve the trade balance and domestic demand, economic growth can be boosted. Controlling the inflation rate is important because a higher rate of inflation is particularly harmful to economic growth or development.

(ii) Proper distribution of income :

To concentrate the impacts of growth toward raising the employment rate in Bangladesh, policymakers must make improvements to the income distribution in that country .

(iii) Reduction of FDI outflow :

From this study it appears that FDI outflow and unemployment is positively related . It means more FDI outflow generates more unemployment in Bangladesh . It is advocated that the government focus on attracting foreign direct investment. To boost economy and lower unemployment, the government must utilize foreign investment properly .

(iv) Promote entrepreneurship and self-employment :

In addition to generating jobs for unemployed, entrepreneurs often help others find work. We can observe from the population pyramid that Bangladesh currently has a sizable pool of potential workers. Thus the problem of unemployment can be handled by encouraging entrepreneurship and self-employment.

(v) Political stability :

Political stability is crucial for reducing unemployment and promoting employment growth for any nations in the world .

(vi) Expansion of employment opportunity :

Both educated and illiterate individuals must have access to employment opportunity . Govt . has to take necessary steps in this regard.

(vii) Labor intensive techniques:

There are abundant labor in Bangladesh , so labor-intensive strategies are required for the impoverished in both rural and urban areas to participate in the economic expansion .

Moreover, Proper education, controlling population growth , Government spending to create job opportunities ,encourage private investment , expansion of industry and training facilities all are important factor for reducing unemployment in Bangladesh .

Conclusion

In many countries, unemployment has been a persistent issue that is still challenging to address. Due to unemployment developing countries as well as underdeveloped countries facing a lot of difficulties.so it is the concerning issue most of the researchers or experts all over the world . But unfortunately only a few works has done on this topics in Bangladesh.

Using data covering the years 2010 to 2021, this study determined the effects of economic growth, FDI (outflow), industry, and age dependency ratio on unemployment in Bangladesh. Regression study shows an inverse relationship between economic growth and unemployment, which is consistent with Okun's Law in Bangladesh. That implies that slower economic growth results from higher unemployment. The impact of industry and age dependency ratio on unemployment is also extensively examined in this article. The only factor that significantly reduces unemployment in Bangladesh is FDI (outflow).. The R^2 value indicates that the model is strongly or good fit of the data . The F -statistics determines that the overall model is significant . Further , the result of Breusch-pagan- Godfrey, Jarque -Bera test, Durbin -Watson d statistics , Ramsey RESET test shows that there is no problem of heteroscedasticity, normality ,autocorrelation and specification of the model respectively .

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