FACTORS AFFECTING GDP GROWTH RATE IN BANGLADESH

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Dedication

To my parents.

Acknowledgments

I would like to express my unbound respect and thankfulness to my supervisor Dr. Mohammad Ali Ashraf for his proper guidance and support during the span of this research. It was him who motivated me to incite my own aptitude for knowing the unknown, encouraged me to the utmost and gave rise to the confidence in me that in an underdeveloped country like ours; it is possible to conduct research of superior quality. He not only acted as my supervisor but also helped me take important decisions of my academic career. Among many things I learned from Dr. Ashraf, perseverance and constant hard work are the keys to open doors of solutions for several important issues in the area of mental task classification. I believe our work advanced the state of the art of the mental task classification problem. I also want to thank him for affording so much time for me in exploring new areas of my research and new ideas and improving the writing of this dissertation. Then, I would also like to thank Prof. Dr. Abul H Azam, and Prof. Dr. Mir Obaidur Rahman, for their encouragement and insightful comments. I would like to thank the Head of the department of Economics for allowing me to use the lab facilities, which contributed greatly in completing the work in time. Most importantly, I wish to thank my parents, without whose prayers and constant support, I could never reach this stage of my life.

Abstract

This study investigates the relationship between one dependent variable Gross Domestic Product (GDP) growth in Bangladesh and four independent variables inflation, employment, interest rate, foreign direct investment. These factors affect GDP growth of our country in various ways. The data is collected from 1991 to 2019 from World Development Indicators (WDI). In this research, multiple linear regression (LR) technique is utilized to assess the effect of inflation, interest rate, employment and foreign direct investment on the GDP growth in Bangladesh. Stata software is used to carry out the analysis. The data used here is secondary data using multiple LR model. There are descriptive statistics, correlation analysis and ANOVA table. After analysis, it is observed that the data is statistically significant to assess GDP growth in Bangladesh.

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Chapter 1

Introduction

Bangladesh is known as a developing economy. But almost one-third of the 150 m people living in extreme poverty in Bangladesh. Due to the development of the micro-credit and garment industry, the country has posted GDP growth rates above 5 percent over the past decade. Although the agriculture sector employs three-fifths of Bangladeshi, three-quarters of export revenue comes from the production of ready-made clothing. Overpopulation, poor infrastructure, corruption, political instability and a slow implementation of economic reforms are the major obstacles to sustainable development in Bangladesh. According to a UN report, Bangladesh will be the world's third fastest growing economy to achieve high Gross Domestic Product (GDP) in 2019.

There are a few problems that have been discussed for a long time and have not been addressed in the development economics literature, one of them being the effect of various factors on GDP as economic growth. In this analysis, GDP reflects the dependent variable and four independent variables taken such as employee remittances and employee compensation paid (WRACE) employment rate, unemployment, interest rate, Foreign Direct Investment Inflows (FDI In), Foreign Direct Investment Outflows (FDI Out). Gross Domestic Product (GDP), Gross National

Product (GNP) and Balance of Payments (BOP) are the most recognized metrics used to measure the economic growth of a country. GDP is the market value of all products and services generated for a period of one year by the individuals and properties of a given country (Afzal, 2007). GNP is the total measure of the flow of goods and services at market value resulting from current production during a year in a country, including net income from abroad (Akhtar and Tahir, 2002). BOP is an overall record of all transactions between residents or individuals of a country and the rest of the world (Aslam, 2010)

This fiscal year, the highest in its history, Bangladesh's economy has grown 8.13 percent, Finance Minister AHM Mustafa Kamal said while releasing a provisional estimate.

The minister issued the latest figure for the 2018-19 fiscal year of the gross domestic product (GDP), which will end this July.

Bangladesh will achieve a GDP growth of 7.65% in the current FY, beating an earlier estimate of 7.4%, according to data from the Bangladesh Bureau of Statistics (BBS). The data also indicated that this expected growth is driven by the industry sector.

Bangladesh's Gross Domestic Product (GDP) grew from the previous year by 7.11 percent in 2016. This measure was withdrawn and replaced by the annual growth rate of Bangladesh GDP. Bangladesh's GDP growth rate averaged 5.69% from 1994 to 2016, hitting an all-time high of 7.11% in 2016 and a record low of 4.08% in 1994.

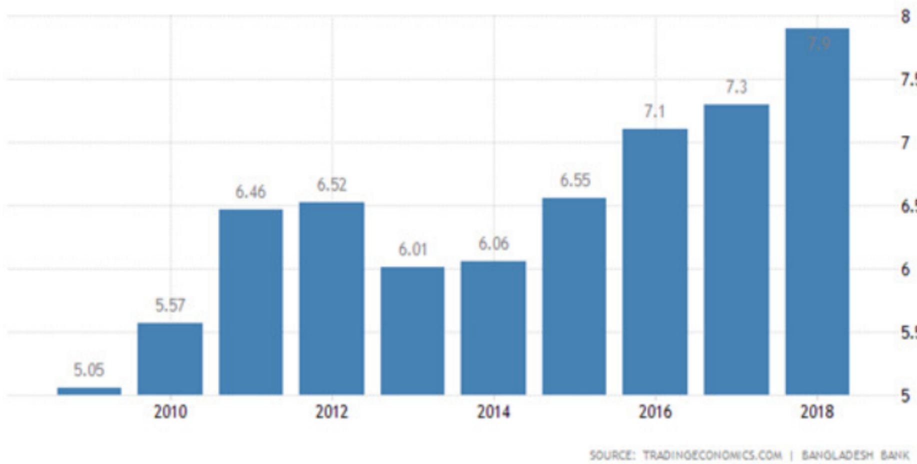

Figure 1.1: GDP growth rate of Bangladesh

1.1 Research Problem

Given the policymakers ' concern about achieving sustainable and rapid growth, it is imperative to statistically estimate the most important factors affecting Bangladesh's growth rate. The study is an attempt to draw policy makers ' attention to the economy's most important sectors with the greatest potential for accelerating economic growth. The factors affecting GDP growth are still ambiguous. As explanatory variables, a whole lot of list of potential factors can be used. However, some variables that are strong enough to explain GDP growth are hard to fix. This may be due to data availability, different country characteristics, different periods of time and other possibilities.

1.2 Research Questions

To strengthen the research objectives, there are several research questions that can be discussed. From the problem statement of the study, following research questions can be constructed:

1. How the employment rate affect gross domestic product?
2. How inflation affect gross domestic product?
3. How interest rate affect gross domestic product?
4. How foreign direct investment affect gross domestic product?

1.3 Research Objective

This study aims to investigate the impact of various selected factors as independent variables on Bangladesh's Gross Domestic Product (GDP). The aim is to conduct a comparative study and analyze the better position of which country by comparing the findings of both countries. The main objective of this study is to study GDP determination in Bangladesh. Nevertheless, the GDP can be determined by many factors. Researchers are therefore trying to find the strong variable and relationship in Bangladesh that affects GDP. Our specific research targets are therefore:-

1. To determine the factors that affected the GDP.
2. To examine the relationship between each independent variable and dependent variable.
3. To research the most significant factor that led to Gross Domestic Product output.
4. To identify the factors that influence GDP in Bangladesh.

Chapter 2

Literature Review

To date, extensive theoretical and empirical research has been conducted that seeks to focus on the relationship between four independent variables namely, inflation, interest rate, employment and FDI and one dependent variable namely the economic growth in both developed and developing countries. A large number of studies, in particular, have focused on economic growth in less developed countries over the past decade. But there is no consensus on the direction of causality regarding GDP and its affective factors. This section presents a short review of economic factors.

2.1 Literature Review

Iqbal (2010) [1] argued that FDI is widely seen as an enhancing factor in economic growth as well as a solution to developing countries ' economic problems. It deals with causality ties between FDI, GDP, exports and imports; it has defined bidirectional causality 21 between FDI and GDP, FDI and exports, GDP and exports, and imports and exports.

FDI benefits for domestic investors and host countries are numerous.Many studies prove that FDI has a positive impact in the host country, some are as follows:

1. Creating new demand for local inputs and generating income from work(Cardoso

and Dornbusch, 1989) [2].

2. Increases in capital formation through FDI-inflowing financial resources.

3. Infrastructure provision (transport, telecommunications, etc.), which increases the profitability of domestic investment (Cardoso and Dornbusch, 1989).

4. The introduction of new manufacturing processes and products by foreign firms, management skills, technology, etc.(Blomstrom, 1989) [3].

However, these positive effects depend on certain preconditions, such as: the openness of the host country to trade (Bhagwati, 1978) [4], a certain level of local financial market development (Alfaro et al., 2004) [5], and sufficiently qualified human capital in the host country (Borensztein et al., 1998) [6].

Muhammad (2000) [7] indicated that non-economic issues in Bangladesh are crucial to a true transformation of any economy. Ahmed [8] investigated the relationship between inflation and economic growth in the context of Bangladesh. The empirical evidence shows that there is a statistically significant long-term negative relationship for the nation between inflation and economic growth as shown by a statistically significant long-term negative relationship between consumer price index (CPI) and real GDP. Afzal (2007) [9] investigated that there is no short-term effect of financial integration on economic growth. The relationship between economic growth and GDP is based on a long-term equilibrium. Investment in the public sector and private investment is mutually beneficial, which in turn promotes economic growth. Positive effects on economic growth may result from the growth of Gross Saving and Population, according to Vissak and Roolaht (2005) [10].

Chapter 3

Research Methodology and Data Collection

In this chapter, all economic variables which are considered while calculating GDP are briefly discussed along with the scenario of GDP in Bangladesh. This study investigates one dependent variable GDP growth in Bangladesh and four independent variables inflation, employment, interest rate, foreign direct investment. These factors affect GDP growth of our country in various ways. In what follows, a brief discussion of research methodology and data collection are presented.

3.1 Research Methodology

Gross Domestic Product (GDP) is the market value of all finished goods and services that developed within a country's boundaries. It can technically be defined as accumulation of private and public expenditure (C), government expenditure (G), investment (I) and net exports ($NX = exports - imports$) i.e. $GDP = C + G + I + NX$. Nearly fifth of Bangladesh's economy had been damaged during the 1971 liberation war and there was a profound macro-economic crisis of the late 1980s and then this worse situation was overcome by introducing a series of stabilization measures in the economy of Bangladesh. The average GDP growth rate in Bangladesh was subsequently increased to 4.8 percent in the 1990s, a complete percentage point. Since 1990, the economy has started to rise sharply (Bhattacharaya, 2002). Following such impressive growth throughout the decade, Bangladesh's per capita income at the beginning of the new decade was not only the lowest among the countries of South Asia, but also below the less developed countries ' average per capita income. Nonetheless, during the period 2006-2008, Bangladesh's GDP increased significantly, increasing at an average rate of 6.4% (Ministry Finance, Bangladesh, 2014). A large number of theoretical and empirical research have found different reasons for change in GDP and growth in the economy (Wu et al., 2010; Hassan, et al., 2011; Lee, 2011). The well-functioning financial system encourages private savings and private investment by increasing investment performance and leading to higher economic growth. Effective financial system is needed, but this is not a sufficient condition for achieving stable economic growth (Ang, 2008; Hassan, 2011). Others may have a significant role to play in explaining GDP development (Christiaans, 2008; Wu et al., 2010; Lee, 2011). While scientific literature is well-off publications on factors influencing GDP 8 development and economic growth, this study does, however, analyze the only impact of a specific factor to predict Bangladesh's GDP.

In this thesis, GDP growth is calculated as a function of employment rate, inflation, interest rate and FDI.

$$GDPGrowth = f(Employmentrate, interestrate, inflation, FDI) \tag{3.1}$$

As a result, GDP growth can be defined as

$$Y = a + b0X + b1X1 + b2X2 + b3X3 + \epsilon \tag{3.2}$$

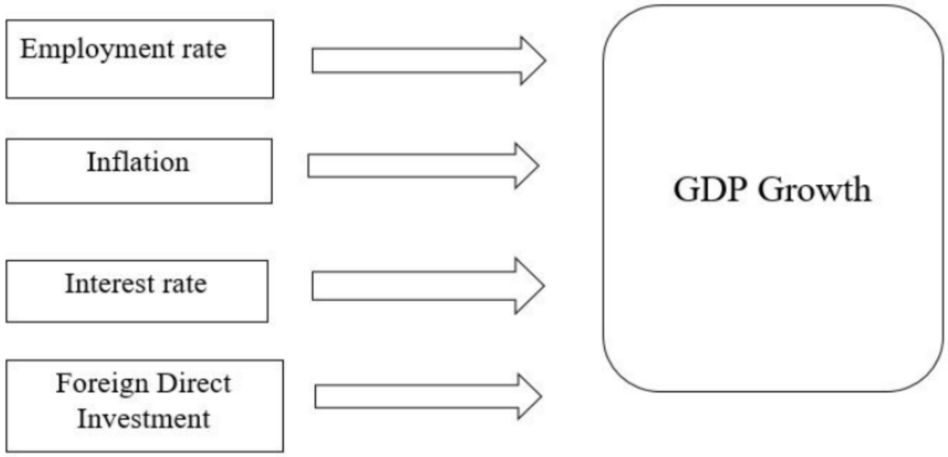

Figure 3.1: Theoretical framework

where

Y= GDP Growth

a = Constant term

$b0$ = FDI

$b1$= Interest rate

$b2$=Inflation

$b3$= Employment rate

Employment rates are defined as a measure of the extent to which available labor resources are being used (people available for work). They are calculated as the ratio between the employed and the work age population.

An interest rate is the amount of interest due per period as a percentage of the amount lent, deposited or borrowed (called the principal sum). It is defined as the proportion of a loaned amount charged to the borrower by a lender as interest, usually expressed as an annual percentage.

Inflation is a quantitative measure of the rate at which an economy increases the average price level of a basket of selected goods and services over a period of time. It is the steady rise in the general price level, where a unit of currency buys less than it did in previous periods.

A Foreign Direct Investment (FDI) is an investment by an entity based in another country in the form of a controlling ownership of a business in one country. Thus a notion of direct control distinguishes it from an investment in a foreign portfolio.

In this thesis,descriptive statistics, correlation coefficients and anova tables are generated to find out whether the data is statistically significant or not. Finally, multiple linear regression model is utilized to find out the affect of employment, interest rate, inflation and FDI on the GDP growth in Bangladesh.

3.2 Data Collection

In this analysis, stata software is used for the time period of 1991-2019. The data sources include annual reports from the World Developments Indicators. Statistics are collected for the variables, namely employment rate, interest rates, inflation and foreign direct investment (FDI). The data will be in percentage for all the variables. The data used here is secondary data using multiple linear regression model.

Chapter 4

Findings

The research uses an ordinary technique of least square regression to assess the effect of the variables, namely employment rate, interest rates, inflation and FDI in Bangladesh. In this chapter, descriptive statistics, correlation analysis and ANOVA table are presented. In what follows, a detail analysis of these tables are described.

4.1 Descriptive Statistics

Descriptive statistics allow researchers to present in a structured, accurate and summarized manner the data acquired (Huysamen, 1990).

Table 4.1: Descriptive Statistics

Variable	Number of Observations N	Mean	Standard Deviation	Min	Max
Employment in services	29	35.72052	7.770029	20.848	46.401
Employment in industry	29	15.97307	4.256534	10.42	22.231
Employment in agriculture	29	48.3061	11.50547	31.431	64.068
Inflation	28	5.752347	3.237191	.1555182	19.14321
Interest Rate Spread	28	4.758333	1.444338	1.871667	8.096667
FDI	28	.666858	.5310298	.0044915	1.735419

The statistical data such as, minimum, maximum, mean and the standard deviations of the variables namely, employment in services, employment in industry, employment in agriculture, inflation, interest rate and FDI is listed in Table 4.1. The highest mean value among these variables is 48.3061 which represents the mean value of the employment in agriculture and the lowest mean value is .666858 which represents the mean value of foreign direct investment.

4.2 Correlation Coefficients

The Pearson Product Moment Correlation Coefficient Cohen and Swerdlik (2002) argue that the Pearson Product Moment Correlation Coefficient is a widely used statistical to obtain an index of the relationships between two variables when the relationships between the variables are linear and the two correlated variables are constant. According to Anastasi and Urbina (1997, p. 88), "the Pearson Product Moment Correlation Coefficient takes into consideration not only the position of the person in the group but also the amount of it or its deviation above or below the mean group." Sekaran (2000) states that the Pearson's 67 Coefficient of Product Moment Correlation provides an indication of the scope to which the variables being investigated are related or not. Sekaran further states that it also indicates the directionality of the relationship and its strength.

In Table 4.2 , the correlation between the variables is investigated. It is found that the positive correlation exists between FDI and inflation (0.2023), between Interest Rate Spread and inflation (0.1356), between employment in agriculture and Interest Rate Spread (0.4330), between employment in industry and FDI (0.8023), between employment in industry and Inflation (0.1400), between employment in services and FDI (0.8368), between employment in services and inflation (0.3194), employment in services and employment in industry (0.7999). On the contrary,

Table 4.2: Correlation Coefficients

Pearson Correlation significant (2 tailed) N	FDI	Inflation	Interest rate	Employment in agriculture	Employment in industry	Employment in services
FDI	1.0000					
Inflation	0.2023	1.0000				
Interest Rate Spread	-0.5391	0.1356	1.0000			
Employment in agriculture	-0.8651	-0.2687	0.4330	1.0000		
Employment in industry	0.8023	0.1400	-0.5178	-0.9132	1.0000	
Employment in services	0.8368	0.3194	-0.3554	-0.9750	0.7999	1.0000

there exists negative correlation between foreign direct investment and interest rate which is-0.5391, between employment in agriculture and foreign direct investment which is -0.8651, between employment in agriculture and inflation which is -0.2687, between employment in industry and interest rate spread which is -0.5178, between employment in industry and employment in agriculture which is -0.9132, between employment in services and interest rate which is -0.3554, between employment in industry and employment in agriculture -0.9750.

The highest positive correlation is found between Employment in services and FDI which is 0.8368 and the lowest positive correlation is found between Interest Rate Spread and Inflation which is 0.1356. The highest negative correlation is found between Employment in agriculture and Inflation which is -0.2687and the lowest negative correlation is found between Employment in services and Employment in agriculture which is -0.9750.

4.3 ANOVA Table

Analysis of variance (ANOVA) is a collection of statistical models and their associated estimation procedures (such as the "variation" between and between groups) used to analyze group mean differences in a sample. ANOVA was developed by the Ronald Fisher, a statistician and evolutionary biologist.

Table 4.3: ANOVA

Source	**Sample size SS**	**Degrees of freedom df**	**Means Square MS**
Model	24.2011691	6	4.03352819
Residual	9.80067426	21	.466698774
Total	34.0018434	27	1.25932753

In Table 4.3, it is found that the sample size of the model is 24.2011691, degrees of freedom is 6,and the means square is 4.03352819. The sample size of the residual is 9.80067426, degrees of freedom is 21 and means square is .46668774.Finally total sample size is 34.0018434, total degrees of freedom is 27 and total means square is 1.25932753.

Table 4.4: Model Summary

Model	R	R Squared	Adjusted R squared	Root MSE	F	Sig
01	0.7118	0.6294	0.6294	.68315	8.64	0.00

Number of observations = 28

F (6, 21) = 8.64

Probability > F = 0.0001

R-squared = 0.7118

Adj R-squared = 0.6294

Root MSE = .68315

Significance =0.00

The population r squared 71% the f test which is significant hypothesis test .The alternative hypothesis is population r square is greater than 0. The adjusted R squared value is 63% or 0.6294.

4.4 Multiple Regression Model

Multiple linear regression (MLR) is a statistical technique that uses several explanatory variables to predict the result of a response variable.

Table 4.5: Multiple Regression Model

GDP growth annual	Unstandardized coefficients		Standardized coefficients	t significance	p>t	95% confidence interval	
	b	Standard Error	β				
FDI	-.2859049	.531603	-.1352917	-0.54	0.596	-1.391434	.819624
Inflation	-.2859049	-0.34	-.0459665	-0.34	0.735	-.1126981	.0808288
Interest rate	-.0159347	-0.51	-.0785056	-0.51	0.619	-.312119	.1901271
Employment in agriculture	-.0609959	-0.64	-1704.696	-0.64	0.531	-725.4758	385.1067
Employment in industry	-170.1279	-0.64	-630.8821	-0.64	0.531	-725.4113	385.1555
Employment in services	-170.0759	-0.64	-1156.539	-0.64	0.531	-725.3859	385.2341
Constant	17019.84	26701.89	0.64	0.531	0.531	-38509.79	-38509.79

In this table, there are regression coefficients b and the intercept of the model is 17019.84. For each predictor namely, foreign direct investment, inflation, interest rate, employment in agriculture, employment in industry, employment in services, regression coefficients are calculated which can be b0, b1, b2, b3, b4, b5. For finding statistical significance forming ratio to their associate standard error and their t value and p value associated with a 2 tailed test are also presented in Table 4.5. $H0 : \beta2 = 0.5$ $H1 : \beta2 \neq 0.5$ so the null hypothesis is rejected and the alternative hypothesis is accepted. For 2 tailed test, $\alpha = .05$. In this multiple regression model, p value is found significant for employment in agriculture, industry and services which is 0.531.

Chapter 5

Conclusion

The purpose of the research is to analyze the relationships between dependent variable GDP growth rate of Bangladesh and independent variables employment rate, inflation, interest rate and Foreign Direct Investment. GDP growth is measured for the data collection of 29 years from 1991 to 2019. Multiple regression model is utilized to investigate the GDP growth rate in Bangladesh using stata software. The World Development Indicators (WDI) is the source of the data. Various factors affect GDP growth rate and economic development of our country.

5.1 Limitations

There are some limitations in this research method and regression analysis. Due to the quality of the data, different characteristics of the data samples, and different data time periods, it is difficult to collect data properly and run in the stata software.

5.2 Scopes for Future Work

In this thesis, multiple linear regression model is utilized to find out the relationship between GDP growth and four independent variables namely interest rate, employment, inflation and FDI. However, in future, instead of four variables, number of variables may be increased or decreased to see it's effect on GDP growth. Moreover, instead of linear regression, polynomial regression may be utilized to find the relationship.

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