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QUEST FOR EXCELLENCE

Factors Affecting Economic Growth of Bangladesh

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Abstract

Higher economic growth is very important to achieve the vision of Bangladesh. Thus this study tries to figure out the impact of determinants of economic growth of Bangladesh using time series data has taken from the period of 1991-2016. GDP is considered as dependent variable and FDI, net inflows, inflation, employment, export and industry growth are considered as independent variables. Co-integration and VECM model with several diagnostic tests has been driven in the study. The results of unit root test shows that growth and export are stationary at level, FDI, inflation and industry become stationary at 1^{st} differentials and employment becomes stationary at 2^{nd} differentials. The study shows all the variables are normally distributed and there is no auto-correlation. And the result of the study is there is a statistically long run positive relationship between employment and GDP and also between export and GDP, although industry has no impact on economic growth. But industry is an important factor for economic growth. If government takes suitable and right policy, industry can boost the economic growth of Bangladesh.

Introduction

Over the last few decades, many researchers have attempted to study and try to identify the determinants of economic growth. Researchers have also tried to identify the determinants of economic growth in Bangladesh. Economic growth can affect positively and negatively where both are important for a country. This paper is going to analyze the determinants of economic growth of Bangladesh.

Bangladesh is a densely populated with 1,252 people per square kilometer (2016) and now considered as a lower middle income country with PPI $1,466 (2017). The economic development of Bangladesh is growing faster. Now the question is why economic development/growth is so much important for Bangladesh? It is important because economic growth indicates the growth in economic output over the period which is measured by GDP. So over the period we can understand the economic condition from economic growth. There are many factors affect economic growth such as inflation, FDI, population growth, capital formation, export, import, employment, unemployment, personal remittance, life expectancy, personal income, industrial growth. Other factors can be living standard, geographical location, demographics, urbanization, democracy, inequality, government spending, poverty etc.

Bangladesh has become independent in 1971 from Pakistan. The war almost completely destroyed the physical infrastructure. There has been huge economic progress in Bangladesh since its independence, accelerated from an average of less than 4% per year during 1972-1990 to 6.4% in 2010-2013. Now the vision of Bangladesh Government is to attain middle income status by the year 2021. Annual growth rate in Bangladesh averaged 5.76% from 1994 until 2017 and it has reached 7.30% in 2017 which is the highest growth rate in economic history of Bangladesh.

Figure 1: GDP annual growth rate

From **figure 1**we can observe how economic growth varies over the period 2008-2017. We can see growth rate decline in 2009. From 2010 growth rate started to increase till 2012. Further growth rate falls in 2013 and after that from 2014 it started to raise again where it achieved upward growth rate. Finally in 2017 it has achieved the highest growth rate 7.3%.

So achieving sustainable economic growth is the principal objective of most countries. Some factors accelerate economic growth. On the other hand, some factors create problem to achieve such objective.

Inflation is such a factor that affect the economic growth. The relationship between inflation and economic growth is one of the most controversial issues in the field of economics. But to attain sustainable growth price stability is one of the main objective for most countries in the world. High inflation adversely affect the economic performance and can infect investment and consumption level, further low level of inflation also bad for example, price level and profit fall, unemployment raises. So economic growth requires balance. The empirical studies indicates that there exists a statistically significant long-run negative relationship between inflation and economic growth Bangladesh has experienced on average 6.56% from 1994 until 2018, reaching

all time high of 16% in September of 2011 and lowest was -0.03% in December of 1996. In July 2018 the inflation rate was 5.51%.

Foreign direct investment is a significant factor to develop the economy of Bangladesh and can play an important role in achieving socio-economic objectives of the country. Since independence, Bangladesh trying to be a suitable location for FDI. Total inflow of FDI has been raising over the year. In 1972, annual inflow was 0.090 USD million, and after 39 years, in 2011 annual FDI reached to $1.13 billion. In 2017, FDI in Bangladesh increased by 1706 USD million.The highest FDI in Bangladesh was 1726 USD million in 2013 and a record low of 276 USD million in 2004. The major countries contributed in FDI net inflow for the fiscal year 2016-2017 were Singapore, UK, USA, Norway, South Korea, Hong Kong, India, Netherlands, China and Thailand. The important thing is FDI in Bangladesh has traditionally been lower, even compared with other South Asian countries. But inflows of FDI can be helpful for broaden economic production and growth. Foreign investment can help to fill the saving investment gap due to the lacks of domestic savings or investment. A country like Bangladesh with low level of capital FDI can generate physical capital, create employment opportunities, increase productive capacity, can intensify the skill of labor through transfer the technology, and help integrate the domestic economy with the global economy.

Employment is one of the important mechanisms for economic growth in Bangladesh and it is also a major tool for poverty reduction in Bangladesh. Poverty reduction strategy will be worked and sustainable if the employment strategy creates productive and decent employment opportunities. Bangladesh has achieved sustainable economic growth over the years, but employment grew at a relatively slow rate of 1.6% annually since 1990s. Agriculture sector is still the largest sector of employment than any other sector.

Figure 2: Employment in Agriculture (% of total employment)

Figure 3: Employment in Industry (% of total employment)

We can compare both agriculture and industry sector from aforementioned figures. **Figure 2** is showing the employment in agriculture, we can see in 2006 total employment in agriculture was almost 48% of total employment and it fluctuate till 2011, after that it is consistently reducing and in 2017, it reached 39.07%. So nevertheless agriculture sector is still an important and largest sector for employment.

Now **Figure 3**is showing employment in Industry, in 2006, industrial employment was very poor nearly 15%, from 2007 it has started to increase but at a decreasing rate and in 2017 it was 21.08%.

(Source: WB collection of development indicators). The chief reasons are lacks of infrastructure, raw materials, lacks of investment and also appropriate strategy.

Export is the very potential factor in the economy of Bangladesh. In a capital poor country like Bangladesh, export and import can build up physical capital, create employment opportunities, develop productive capacity and integrate the domestic economy with the global economy. Export in Bangladesh decreased to 211.088 BDT Billion in June from 243.39 BDT Billion in May of 2018 that is not good for the economy. On the other hand, in Bangladesh, the value of import has always been greater than the value of export. For this the balance of trade is not favorable of Bangladesh. This has result sustained fall in the external value of our currency that means a steady increase in exchange rate over the period.

This study is an attempt to investigate the effective determinants of economic growth of Bangladesh and policy recommendation. The study is formed as follows: Introduction, Literature review, Data and Methodology, Data analysis and discussion of result and conclusion with policy recommendations.

Literature review

There are lots of paper on the impact of determinants of economic growth. It has been very much engrossing and significant topic for economic research for decades. There are many researches shows that the determinants such as inflation, FDI, net inflows, population growth, personal income, employment, life expectancy at birth, capital formation, export, import, industry growth of economic growth is most effective. On the basis of these existing information, an effort has been made to make an overview of those literature.

Majumder (2016) studied the relationship between inflation and economic growth of Bangladesh between years 1975 to 2013. To test stationary, Augmented Dickey Fuller test is used. Author uses Granger Causality and after that error connection model to find out the long run relationship between inflation and economic growth. Here the author took Gross domestic product as dependent variable and three variables inflation, money supply and remittance as independent variables. The result showed that there had statistically significant relationship between inflation and economic growth.

Hossian, Ghosh and Islam (2012) tried to determine the long run relationship between inflation and economic growth in Bangladesh and use data from 1978 to 2010. The result of co-integration test showed there was no co- integrating relation between inflation and economic growth in Bangladesh. Nevertheless they checked causality relationship between dependent and independent variables by applying VAR-Granger causality at two different lag periods. But the results showed the same at different lags. This conclude that causality ran from inflation to economic growth and thus inflation had indeed impact on economic growth.

To analyze the role of FDI in economic growth Faruk (2013) used GDP took as dependent variable and FDI as the independent variable. The result showed that FDI is statistically significant and can explain 83% Fluctuation about of GDP. The correlation showed that GDP and FDI is highly correlated (0.912024), in the perspective of Bangladesh economy, especially different sector like Garments, Banking, Telecommunication, Fertilizer and other manufacturing sectors.

A similar study conducted by Rahman (2012) also showed that FDI has significant influence on GDP in Bangladesh.

Rahman (2015) tried to investigate the impact of FDI on the economic development of Bangladesh. The study has examined time series data from 1990 to 2013. The result of this study is different from previous two studies. The result obtained of this paper signify the negative correlation between FDI and economic growth. Because the pearson correlation was .38, indicating that moderate positive correlation between FDI and GDP growth, but the significance level was .08, suggesting that the relationship between FDI and GDP growth is not statistically significant.

Obioma, Uchenna and Alexanda (2015) studied that the effect of industrial growth on economic growth in Nigeria by using data from 1973 to 2013. They used Ordinary least square (OLS) method to find out the influence of the industrial growth on economic growth. The sign observed is positive but not strong to be significant. It described that industrial output is not significant to improve the level of economic growth, although it has a positive relationship with GDP but was not significant to improve the level of economic growth.

Sultan (2008) tried to analyze the relationship between trade, industry and economic growth in Bangladesh by using annual data for 1965-2004. The study took GDP as dependent variable and export, import and industry value added as independent variables. The sign observed is positive but not strong to be significant. The result directly showed that only import or export cannot contribute to the economic growth unless industrial growth occurs.

Dey (2016) tried to investigate the impact of export revenue on GDP in Bangladesh during the period of 1981-2015. Author took GDP as dependent variable and remittance, FDI and export revenue as independent variable to analyze the model. Granger causality test indicates that there was bidirectional causality from export to GDP in Bangladesh. Johansen co-integration test confirmed the existence of the long run equilibrium relationship between the variables of the model. The VECM showed that there was no statistically significant long run positive relationship between export revenue and GDP. But Bangladesh has indicated a statistically significant short run positive relation between export revenue and GDP.

Methodology

Selection of Variables and Data: The empirical objective of this study is to find the link between GDP as dependent variable and FDI (net inflows), inflation, employment, export and industry growth as independent variable. Data are collected from the World Bank considering the period of 1991-2016.

Model specification: This study is trying to figure out the impact of independent variables on dependent variable. Thus the model is,

GDP= f (FDI, Inflation, Employment, Export, Industry growth)

Or GDP= $\infty+B\text{Fdi}t+\delta\text{Inf}_t+\sigma\text{Emp}_t+\Theta\text{Exp}t+\upsilon\text{Ind}_t+U_t$

Where,

GDP= Growth rate of gross domestic product (annual %), Fdi= Foreign direct investment, net inflows, Emp= Employment, Exp= Export, Ind=Industry growth, ∞, B, δ, σ, Θ, υ are parameters to be estimated,U is error term and t is the time period from 1991-2016.

Description of Variables:

Variable Name	WB Indicator Name	Description
Growth	GDP growth (annual %)	Annual % growth rate of GDP at market prices based on local currency. Aggregates are based on constant 2010 US$.
FDI	Foreign direct investment, net inflows (BoP, current US$)	FDI refers to direct investment equity flows in the reporting economy. It is the sum of equity capital, reinvestment of earnings & other capital.
Inflation	Inflation, GDP deflator (annual %)	Inflation is measured by the annual growth rate of GDP

		implicit of deflator shows the rate of price change in the economy as a whole.
Employment	Employment to population ratio, 15+, total %, (modeled ILO estimated)	Employment to population ratio is the proportion of a country's population that is employed.
Export	Exports of goods & services, % of GDP	Exports of goods & services represent the value of all goods & other market services provided to the rest of the world.
Industry growth	Industry, value added (annual % growth)	Annual growth rate for industrial value added based on constant local currency. Aggregates are based on constant 2010 US$.

Source: World Bank

Estimation Technique: Based on the variables and data, Ordinary Least Square (OLS) regression model is not appropriate for this study. So it will be suitable to use Vector Error Correlation Model (VECM). Used Augmented Dickey Fuller unit root test to figure out whether it is stationary or not. On the basis of stationarity and if it required, testing co-integration.

Diagnostic testing: After model analysis, the study use Jarque-Bera test for normality test, Breusch-Pagan test for heteroscedasticity, Lagrange-multiplier test for autocorrelation, Portmanteau test for white noise.

Result Analysis

Augmented Dickey-Fuller Test for unit root:

Null Hypothesis: $H_o = 0$

Alternative Hypothesis: $H_1 \neq 0$

Table-1: Augmented Dickey-Fuller Test							**Integrated Level**
Oder	**Level Form**		**1st Differentials**		**2nd Differentials**		
Variables	**Cal. value**	**95% C.I (P-value)**	**Cal. value**	**95% C.I (P-value)**	**Cal. value**	**95% C.I (P-value)**	
Growth	-2.409	-1.714 (0.01220)*	-2.999	-1.761 (0.0048)*	-	-	**I(0)**
FDI	-0.115	-1.753 (0.4551)	-2.491	-1.761 (0.0129)*	-	-	**I(1)**
Inflation	-2.875	-1.753 (0.0058)*	-6.469	-1.761 (0.0000)*	-	-	**I(0)**
Employment	1.086	-1.753 (0.8529)	-1.401	-1.761 (10.0915)	-5.082	-1.771 (0.001)*	**I(2)**
Export	-2.117	-1.753 (0.0257)*	-2.951	-1.761 (0.0053)*	-	-	**I(0)**
Industry Growth	0.045	-1.753 (0.5175)	-2.623	-1.761 (0.0100)*	-	-	**I(1)**

Table 1 given above shows the result of Augmented Dickey-Fuller test for unit root which was done for each variable and shows growth and export are stationary in level form and rest of the variables were non-stationary in level form. FDI, inflation and industrial growth were stationary in the 1st differential form and employment was stationary in 2nd differential.

Vector Error-Correlation Model:

Johansen tests for co-integration

Trend: trend — Number of obs = 24

Sample: 1993 – 2016 — Lags = 2

Table-2: Johanson tests for co-integration

maximum rank	parms	LL	eigenvalue	trace statistic	5% cri.value
0	48	-219.01982	.	134.6807	104.94
1	59	-196.22289	0.85039	89.0869	77.74
2	68	-181.20534	0.71391	59.0518	54.64
3	75	-168.47475	0.65385	**33.5906***	34.55
4	80	-158.00207	0.58219	12.6452	18.17
5	83	-152.13185	0.38687	0.9048	3.74
6	84	-151.67945	0.03700	-	-

Johansen tests for co-integration shows the rank at which the model is co-integrated. Table shows the eigenvalue, trace statistic and 5% critical value, for all variables there exist at least 3 co-integrating equations. The equations are given in table 3. The equations also showed the high level of significance becauseall equations are less than 5%.So Vector error Correlation Model (VECM) can be performed.

Co-integrating Equations

Table 3: Co-integrating Equations			
Equations	**Parms**	**chi2**	**P>chi2**
Ce1	3	39.6611	0.0000
Ce2	3	35.18891	0.0000
Ce3	3	38.38916	0.0000

Identification: beta is exactly identified

Diagnostic tests for VEC Model

Table 4: Jarque-Bera Test			
Equation	**chi2**	**df**	**Prob>chi2**
growth	0.603	2	0.73964
fdi	0.106	2	0.94817
inflation	6.291	2	0.04304
employment	1.395	2	0.49786
export	16.252	2	0.00030
industry	2.946	2	0.22928
ALL	27.593	12	0.00634

H0: All residuals are not normally distributed

H1: All residuals are normally distributed

The overall JB test is 0.00634 that is less than 5%. So we can reject the null and accept the alternate hypothesis. Thus, all residuals are normally distributed.

Johansen normalization restriction imposed

Table 5: Johansen normalization restriction imposed				
Beta	**Coef.**	**Std. Err.**	**z**	**P>|z|**
_Ce1				
_cons	-145.9696	.	.	.
Growth	1	.	.	.
FDI	-2.22e-16	.	.	.
Inflation	-1.04e-17	.	.	.
Employment	2.636749	1.45805	1.81	0.071
Export	-.1681763	.0297902	-5.65	0.000
Industry growth	-.3144812	.4504174	-0.70	0.485
Beta	**Coef.**	**Std. Err.**	**z**	**P>|z|**
_Ce2				
_cons	-76.80889	.	.	.
Growth	-1.11e-16	.	.	.
FDI	1	.	.	.
Inflation	6.94e-18	.	.	.
Employment	1.41144	.6239924	2.26	0.024
Export		.0127491	-5.42	0.000
Industry growth		.1927623	-0.24	0.811
Beta	**Coef.**	**Std. Err.**	**z**	**P>|z|**

_cons	2037.132	.	.	.
Growth	0	.	.	.
FDI	-3.55e-15	.	.	.
Inflation	1	.	.	.
Employment	-36.4929	11.22998	-3.25	0.001
Export	1.383113	.2294455	6.03	0.000
Industrial growth	-5.399634	3.46914	-1.56	0.120

_Ce1showsthat employment has a significant relationship with growth, so the null hypothesis can be accepted that there has a significant relationship between employment and growth. Further, export has also a significant relationship between export and growth, so null can be accepted, H0: there is a significant relationship between export and growth. But the industrial growth does not show any significant relationship with growth.

In**_Ce2,** FDI is dependable variable, it shows employment and export have significant relationship with FDI, but industrial growth has no significant relationship with FDI.

And in **_Cel3,** assuming that inflation as a dependent variable. **_Ce3**shows that employment and export are significantly related with inflation, but industrial are not.

Lagrange-multiplier test

Table 6: Lagrange-multiplier test

lag	**Chi2**	**df**	**Prob>chi2**
1	26.4389	36	0.87799
2	38.6610	36	0.35034

H0: no autocorrelation at lag order

Here the probabilities of lag values are greater than 5%, thus we cannot reject the null, rather accept the null. So there is no autocorrelation in the lag order. Thus this study is free from autocorrelation and this study is free from the influence of impact of autocorrelation.

Portmanteau test for white noise

Table 7: Portmanteau test for white noise	
Portmanteau (Q) statistic	7.2794
Prob > chi2(10)	0.6988

H0: Residual is white noise

H1: Residual is not white noise

As the probability is greater than 5%, the null hypothesis cannot be rejected, rather accept the null.

Conclusion and Policy Recommendation

The time series analysis shows the model is co-integrated and all the variables are almost normally distributed. No auto-correlation exists in the analysis and no white noise error term exists. And employment and export are significant, thus employment and export have long run impact on economic growth. But industrial growth is not significant, so it has no impact on economic growth.

From the last few years the economic growth of Bangladesh has been achieving sustainable economic growth. Governance can take more suitable strategies on export and employment to boost the economic growth. Although industry has no impact on economic growth, but it can be a vital source to boost the economic growth. All of these will be possible if the country can achieve good governance.

The root of the economic growth in Bangladesh is “good governance. So good governance can play a significant role for a healthy and independent economy. But good government in Bangladesh is rare in Practice because the public and private officials are not accountable and decision making is not transparent. Corruption is the main problem in the government. Thus to ensure good governance the first prerequisite is to minimize the corruption. Economic growth also requires political stability which is also rare in Bangladesh. So when good governance will be established, political instability will be reduced. With good governance new door will be open for the economy of Bangladesh.

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Appendix

Variable Name	Definition
Growth	GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies no included in the value of the products. It is calculated without making deductions for depreciations of fabricated assets.
FDI	Direct investment is a category of cross-border investment associated with a resident in one economy having control or a significant degree of influence on the management of an enterprise that is resident in another economy. Ownership of 10% or more of the ordinary shares of voting stock is the criterion for determining the existing of a direct investment relationship.
Inflation	The GDP implicit deflator is the ratio of GDP in current local currency to GDP in constant local currency.
Employment	Employment is defined as persons of working age who, during a short reference period, were engaged in any activity to produce goods or provide services for pay or profit, whether at work during the reference period (who worked in a job at least one hour) or not at work due to temporary absence from a job, or to working-time arrangements, Ages 15 and older are generally considered the

	working age population.
Export	They include the value of merchandise, freight, insurance, transport, travel, royalties, license fees, and other services. They exclude compensation of employees & investment income & transfer payment.
Industry growth	Industry corresponds to ISIC divisions 10-45 & includes manufacturing (ISIC divisions 15-37). It comprises value added in mining, manufacturing, construction, electricity, water and gas. Value added is the net output of a sector after adding up all outputs & subtracting intermediate inputs. It is calculated without making deductions for depreciation of fabricated assets. The original value added is determined by ISIC.

Source: World Bank