IMPACT OF FOREIGN DIRECT INVESTMENT AND TRADE OPENNESS ON ECONOMIC GROWTH OF BANGLADESH:
AN EMPIRICAL ANALYSIS

By

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Declaration

It is hereby declared that

1. The thesis submitted is my/our own original work while completing degree at Brac University.

2. The thesis does not contain material previously published or written by a third party, except where this is appropriately cited through full and accurate referencing.

3. The thesis does not contain material which has been accepted, or submitted, for any other degree or diploma at a university or other institution.

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Abstract

This paper assesses the relationship between FDI, international trade and economic growth of Bangladesh in the presence of macroeconomic instability, by empirically analyzing available data over the time period of 1980 - 2018. Results from Augmented Dickey-Fuller test, OLS regression, Johansen test of co-integration and Vector Error-Correction Model suggest that there is positive relationship between FDI, trade openness and GDP, and that there exists a long-run association between FDI and per capita GDP. Therefore, the government should take appropriate policy measures to attract foreign investors to generate more employment opportunities within the economy and contribute to the reduction of poverty. However, the policies must be framed keeping in mind the political instabilities faced by Bangladesh.

Keywords: FDI; per capita GDP; international trade; developing country

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List of Acronyms

ADF   Augmented Dickey-Fuller Test

BRICS   Brazil, Russia, India, China and South Africa

CPI   Consumer Price Index

FDI   Foreign Direct Investment

GDP   Gross Domestic Product

OLS   Ordinary Least Square

VECM   Vector Error Correction Model

Chapter 1

Introduction

Over the last two decades, foreign direct investment has played a crucial role in the development of Bangladesh from an agriculture-based economy to an industrial economy. Most FDI-financed firms in Bangladesh are focused on exports and trade a large proportion of their output overseas compared to other local export-oriented firms (Prabhakar et al., 2015). Such firms often benefit from having comparative advantage in terms of their efficiency and the knowledge they possess of the various global distribution channels. Moreover, FDI also allows imports to increase when certain goods or raw materials for production are not readily available in the country.

Despite being cynical towards FDI until the 1980s and experiencing poor infrastructure and political instability, Bangladesh eventually became one of the biggest FDI-recipient countries in South Asia in the last decade, mostly due to its cheap labor cost. Following this, the government of Bangladesh has been more encouraging towards foreign investors, which has contributed to the enhancement of the country's employment levels, infrastructure and technology.

Before 1990s, international trade in Bangladesh was much smaller relative to the size of its population. However, according to the World Bank (2019), exports from Bangladesh had experienced an upward trend since 1990s, rising from approximately US$1.9 billion in 1990 to US$6.6 billion in 2000, with the United States being the largest trading partner for Bangladesh, mainly in the Ready-Made Garments (RMG) sector. Imports to Bangladesh, on the other hand, was at US$4.2 billion in 1990 and then increased to US$9.1 billion. Recent data shows that international trade in Bangladesh increased enormously in the last decade, with exports

reaching US$37.5 billion and imports amounting to US$50.6 billion in 2017, reflecting Bangladesh's long history of maintaining a negative trade balance (World Bank, 2019).

A vast majority of the existing research on the relationship between FDI, international trade and economic growth has focused on the South Asian countries or the BRICS. Very little literature exists on the impact of FDI and trade openness on the economic growth of Bangladesh, possibly due to the relatively smaller level of FDI in Bangladesh compared to other South Asian countries such as India. Furthermore, even fewer studies have accounted for inflation which brings uncertainty to the effects of FDI on an economy and can counteract FDI inflows. Therefore, the main focus of this study is analyzing the impact of inflows of foreign direct investment and trade openness on economic growth, in the presence of macroeconomic instability (inflation) in Bangladesh, along with some other significant macroeconomic variables.

To evaluate the impact of the factors considered on economic growth, the study models economic growth as a function of foreign direct investment and trade, controlling for the variable inflation to account for macroeconomic instability, along with remittances, capital investment, etc. Results from the Augmented Dickey-Fuller test for unit root and Ordinary Least Square regression analysis suggested that both foreign direct investment and trade have a positive impact, whereas remittance inflows have a statistically significant negative impact on per capita GDP. Based on the results from the Johansen's test of co-integration and the VECM analysis, a long run co-integrating association between FDI and per capita GDP was found.

Based on these findings, it can be concluded that, it is crucial for the government to undertake appropriate policy measures to attract foreign investors, which will eventually generate more employment opportunities within the economy and contribute to the reduction of poverty.

However, the policies must be framed keeping in mind the political instabilities faced by this country regularly, as such phenomena have adverse effects on the overall macroeconomic performance of an economy.

This study assesses the relationship between FDI, international trade and economic growth of Bangladesh in the presence of macroeconomic instability, by empirically analyzing available data from secondary sources which consist of annual observations over the last four decades (1980-2018). In the remaining paper, section 2 presents a review of the relevant past literatures, while section 3 reports the data, methodology and model specification of this study. Following that, the empirical findings are discussed and analyzed in section 4 and the results are reported in section 5. Lastly, section 6 presents the conclusion, along with limitations of the study and some policy recommendations.

Chapter 2

Relevant Literature

Azam (2010) studied the impact of exports and FDI on economic growth of four South Asian countries- Bangladesh, India, Pakistan and Sri Lanka, using panel data regression from the time period of 1980-2009. His study found that there is a statistically significant relationship between FDI and growth of these countries. Based on his study, the author recommended that these countries should diversify and expand their export sector to increase FDI inflows, as there is scope for accelerated export-led economic growth in the South Asian economies. However, a study by Ilgun, Koch and Orhan (2010), which empirically investigated the impact of FDI on economic growth in Turkey, found mixed conclusions about the relationship between FDI and growth, as different time intervals within the time period considered in the study indicate positive, negative and no significant relationship between the variables.

Agrawal and Khan (2011) analyzed the impact of FDI on economic growth rate of India and China, using data over the period of 17 years from 1993-2009. Using Ordinary Least Square method on a multiple linear regression model which included FDI, GDP, labor force and human capital as the main variables, the study found that one percentage increase in FDI raises GDP by 0.02% in India and 0.07% in China. Moreover, the authors found that FDI inflows in India affects economic growth much less than in China, since the later can utilize FDI better.

A study by Hossain and Hossain (2012), which examined the co-integration and the causal relationship between FDI and growth in Bangladesh, Pakistan, and India, found existence of co-integration between FDI and economic growth in both long and short term for Pakistan. In contrary, a Granger Causality test revealed that there study found no causal relationship between GDP and FDI in Bangladesh, whereas a unidirectional relationship appeared for Pakistan and India, which suggested that economic growth resulted from FDI

inflows in these two countries. In addition, a study conducted by Tabassum and Ahmed (2014) on the relationship between FDI and economic growth of Bangladesh during the period 1972–2011, suggested that domestic investments have a strong positive influence on growth, while FDIs and trade openness are less significant.

Following this, Sethi and Sucharita (2015) reported a strong positive correlation between FDI and per capita GDP of Bangladesh, using a simple regression analysis based on data from 1974 to 2009. However, the multiple regression analysis conducted in their study, using the same data set, suggested a positive yet statistically insignificant association between FDI and per capita GDP of Bangladesh.

Despite a few studies suggesting insignificant or no long-term connection of FDI with the GDP of Bangladesh (Shimul, Abdullah & Siddiqua, 2009), using a co-integration analysis and a Vector Error Correction Model (VECM) for the time period 1973-2014, Hussain and Haque (2016) reported that trade and FDI have significant impacts on the GDP growth rate of Bangladesh. Similarly, Haque and Amin (2018) suggested that there is a long run co-integrating relationship between FDI and economic growth of Bangladesh. Moreover, the study also found that unidirectional causality relationships between trade openness, FDI and economic growth, suggesting that trade has an impact on both inflation and the economic growth of the country. Therefore, the study concluded that, FDI and growth are positively associated, while trade openness had no impact on this relationship.

Most existing empirical literature focus mainly on the impact of FDI and trade on economic growth of emerging economies or developing countries. Although there are several studies on the relationship between FDI and economic growth in Bangladesh, research on the effect of both FDI and trade openness is quite limited. Furthermore, only a small percentage of the few studies which exist on this topic include inflation to account for macroeconomic stability. In

this context, this study aims to evaluate the impact of FDI and trade openness on economic growth of Bangladesh, accounting for macroeconomic instability along with some other significant macroeconomic variables.

Chapter 3

Methodology

The empirical analysis of this study is based on the secondary data resources of annual observations obtained from World Bank online database (World Development Indicators) and various periodical issues of Bangladesh Bank and Bangladesh Bureau of Statistics published until the year 2018. In order to determine the relationship between foreign direct investment, trade openness and economic growth in Bangladesh, time-series data over the period of 1980 to 2018 has been collected for the following macroeconomic variables- gross domestic product (GDP), foreign direct investment (FDI), trade openness, inflation, remittance inflows, financial development (broad money) and capital investment.

Several estimation techniques have been used in this paper to analyze and evaluate the relationship between the variables considered, such as:

a) Unit-Root Test- Augmented Dickey Fuller Technique

b) Regression using Ordinary Least Square (OLS) Method

c) Co-integration Test- Johansen Approach

d) Vector Error-Correction Model (VECM) Estimation

Unit-Root Test- Augmented Dickey Fuller Technique

Unit root tests are conducted to determine whether the time-series data used are stationary or non-stationary. It is crucial to ensure the stationarity of the data being used in order to prevent

spurious regression results. Therefore, this study undertakes a unit root test on all the variables considered using the Augmented Dickey Fuller (ADF) technique

The tests are performed in first difference form, to check if the data has indeed been made stationary, by considering two different models – a model with an intercept assuming that there are no linear trends in the data, and another model with a linear trend. In order to determine the stationarity of the data from the ADF test, the null hypothesis stating that there is unit root must be rejected in favor of the alternative hypothesis which claims that the data is stationary.

Ordinary Least Square (OLS) Method for Regression

Once the time-series data is found to be stationary, the study conducts a multi-linear regression analysis among the variables- per capita GDP, foreign direct investment and trade openness, controlling for inflation which represents macroeconomic instability in the economy, and some other macroeconomic variables such as remittance inflows, financial development and capital investment.

The OLS regression model specification is as follows:

$$Y = \alpha + \beta_1 (X_1) + \beta_2 (X_2) + \beta_3 (X_3) + \beta_4 (X_4) + \beta_5 (X_5) + \beta_6 (X_6) + \varepsilon$$

where, Y = Gross Domestic Product (GDP), X_1 = Foreign Direct Investment (FDI), X_2 = Trade Openness, X_3 = Inflation, X_4 = Remittance Inflows, X_5 = Financial Development, X_6 = Capital Investment, βi = coefficient of explanatory variables, α = intercept, ε = error term.

Co-integration Test: Johansen Approach

Following this, the paper conducts a co-integration test to determine whether any long run relationships exist among the variables in the series. According to Sjo (2008), the Johansen approach for a co-integration test is more superior to the other techniques, since it presents a unified framework in context of vector error-correction models.

The two tests for co-integration used in the Johansen approach are the "trace test" and the "maximum Eigen value test". The statistics from the trace test provides with the maximum number of co-integrating vectors among the variables, whereas the maximum Eigen value test determines the exact number of potential co-integrating vectors in the series.

Vector Error-Correction Model (VECM) Estimation

Once the co-integrating test confirms the existence of a long run relationship, the vector error-correction model (VECM) is estimated in order to determine the nature and extent of the relationship between the variables considered. After estimation, the model is tested for existence of any serial-correlation within the variables using the "Lagrange Multiplier" test, in order to evaluate the accuracy of the model.

Chapter 4

The Empirical Work

4.1 Data Description

The paper analyzes time-series data for Bangladesh over the period of 1980 to 2018 for economic growth, which is measured in terms of per capita GDP (US dollars); foreign direct investment (FDI) and trade openness measured as a share of GDP; and controlling for inflation as measured by GDP deflator. Unlike most literature, this study considers inflation in terms of GDP deflator instead of the consumer price index (CPI), because the GDP deflator accounts for changes in consumption patterns, as well as the introduction of new goods and services within the economy, which the CPI does not.

The study also incorporates some additional controlling variables, namely remittances inflow, financial development (broad money) and capital investment, all three of which are measured as a share of GDP. However, other variables which are likely to contribute to economic growth of Bangladesh, such as human capital in terms of primary and secondary school enrollment, could not be incorporated into the study due to unavailability of sufficient data for the time period considered. Nevertheless, this paper is based on the most recent data available, and therefore, has more observations involved in the analysis compared to past studies.

4.2 Descriptive Statistics

According to the sample of the 39 observations considered in this paper, for the time period of 1980-2018, the mean per capita GDP of Bangladesh is USD 550. On average, foreign direct investment (FDI) is 52.4% of GDP, while trade openness on average is approximately 29.4%, indicating a moderately low openness in the sample. The mean inflation rate is at 7.05% and the remittance inflows are around 5% of GDP on average. The mean financial development (broad money) is approximately 38%, while the mean domestic capital investment is around 22%.

Table 1. Descriptive Statistics

Variables	Obs.	Mean	Std. Dev.	Min	Max
Per capita GDP	39	550.029	392.428	204.418	1698.263
FDI (% GDP)	39	0.524	0.605	-0.0299	2.100
Trade (% GDP)	39	29.404	9.866	16.688	48.111
Inflation (GDP Deflator)	39	7.051	4.008	0.156	19.143
Remittance (% GDP)	39	5.003	2.733	1.867	10.588
Broad Money (% GDP)	39	37.659	17.697	14.058	65.848
Capital Investment (% GDP)	39	22.220	5.171	14.439	31.235

Note: The table shows descriptive statistics of the dependent and explanatory variables from 1980 to 2018.

The minimum and maximum values of FDI as a share of GDP has been the lowest compared to the other explanatory variables represented in Table 1. The statistics also imply that trade openness, financial development and capital investment have had moderate to high values as shares of GDP throughout the time frame considered.

In addition, the correlation statistics show that FDI and trade have a strong positive correlation to GDP in Bangladesh, whereas inflation (GDP deflator) is negatively correlated to GDP (refer to Table 2). The data presented also suggest that remittance inflows are moderately correlated to GDP, while both financial development and capital investment have strong correlation with GDP in Bangladesh.

Table 2. Correlation Matrix

	Per capita GDP	FDI	Trade	Inflation	Remittance	Broad Money	Capital Investment
Per capita GDP	1						
FDI	0.72	1					
Trade	0.74	0.91	1				
Inflation	-0.15	-0.15	-0.17	1			
Remittances	0.61	0.91	0.92	-0.16	1		
Broad Money	0.88	0.87	0.91	-0.27	0.87	1	
Capital Investment	0.85	0.83	0.91	-0.31	0.81	0.94	1

The annual per capita GDP (current US dollars) of Bangladesh, which is the dependent variable in my study, has had an overall increasing trend over the period of 1980 -2018. The growth in per capita GDP was relatively steady up until the 90s. However, since 2001, the annual per capita GDP continued to rise exponentially, as illustrated in Figure 1. Recent statistics show that, per capita GDP in Bangladesh reached its highest of approximately US$ 1,700 in 2018, is expected to continue to rise further in the future (Bangladesh Bank, 2019).
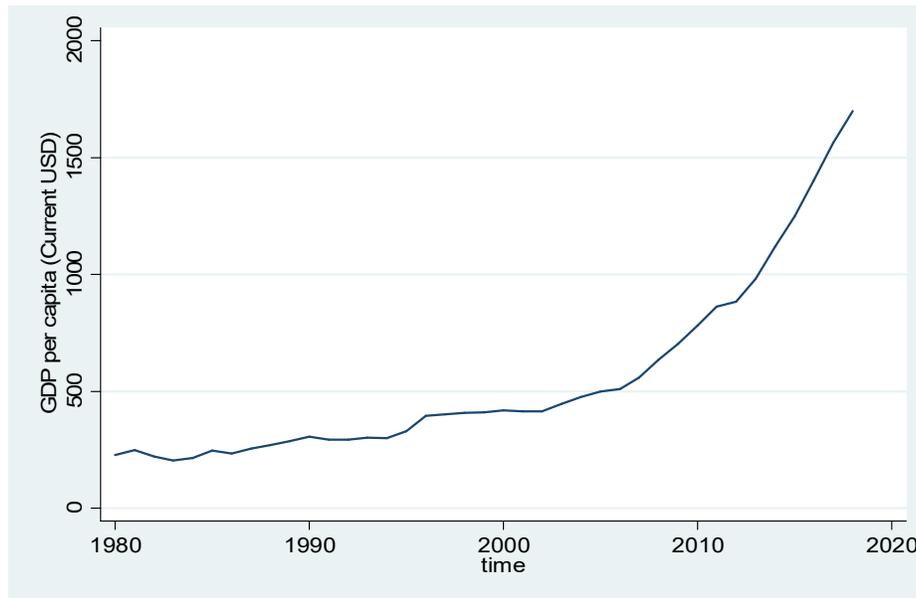

Figure 1. Time Series Plot of the per capita GDP of Bangladesh, 1980 – 2018

Illustrated in Figure 2, the time series plot of the independent or explanatory variables present an interesting scenario. Until 1995, foreign direct investment as a share of GDP was very close to zero. Since the late 90s, FDI in Bangladesh began to rise, having an overall increasing trend, reaching its peak of 2.1% in 2013 (also refer to Table 1), but decreasing dramatically since 2015.

In Bangladesh, trade openness had an overall increasing trend since the late 80s, maintaining a share of GDP of above 16% ever since, and reaching its highest of approximately 48% in 2012 (refer to Figure 2). Despite a slight decrease afterwards, trade in Bangladesh has begun to

follow an upward trend since 2018. Inflation in Bangladesh experienced high fluctuations during the 80s and the 90s, reaching its lowest during 1993 and highest in 1996. However, since late 90s, the inflation rate in terms of GDP deflator has been relatively steadier.
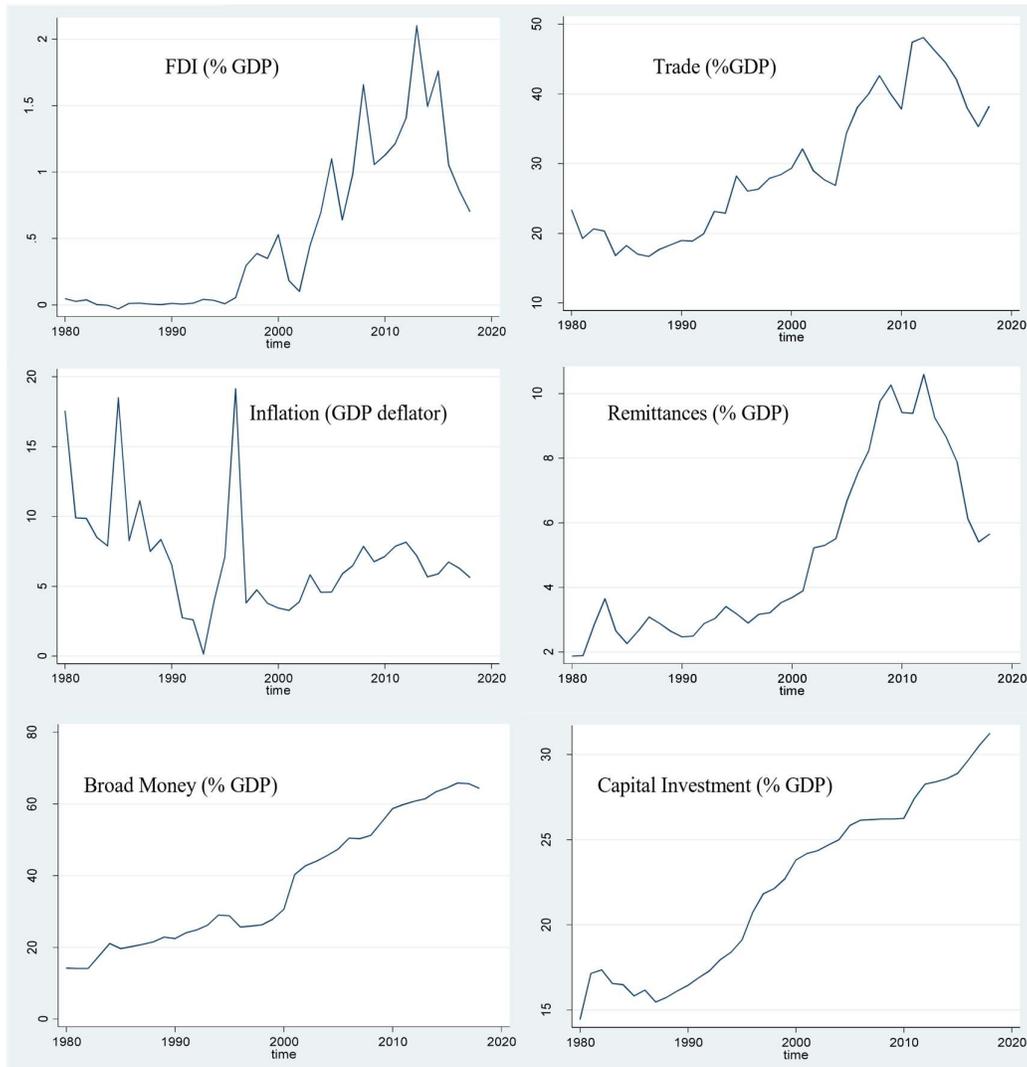
Figure 2. Time Series Plot of the Explanatory Variables, 1980 – 2018

The inflow of remittances in Bangladesh has followed a similar trend to trade openness, experiencing an overall increasing trend since 1990, reaching its peak of approximately 10% in 2012 (also refer to Table 1), and then plummeting to around 5% in 2017. Financial development of Bangladesh, in terms of broad money as a share of GDP, and capital investment as a share of GDP have both experienced an overall increasing trend, with capital investment increasing at a slightly higher rate than financial development.

Chapter 5

Results

Based on the graphs presented in Figure 2, only the GDP deflator has stationary data among all the other variables. Therefore, plotting the differences of the remaining variables suggests that the data are stationary in terms of first differences, except for per capita GDP. The first-differenced graphs are presented in Figure 3.
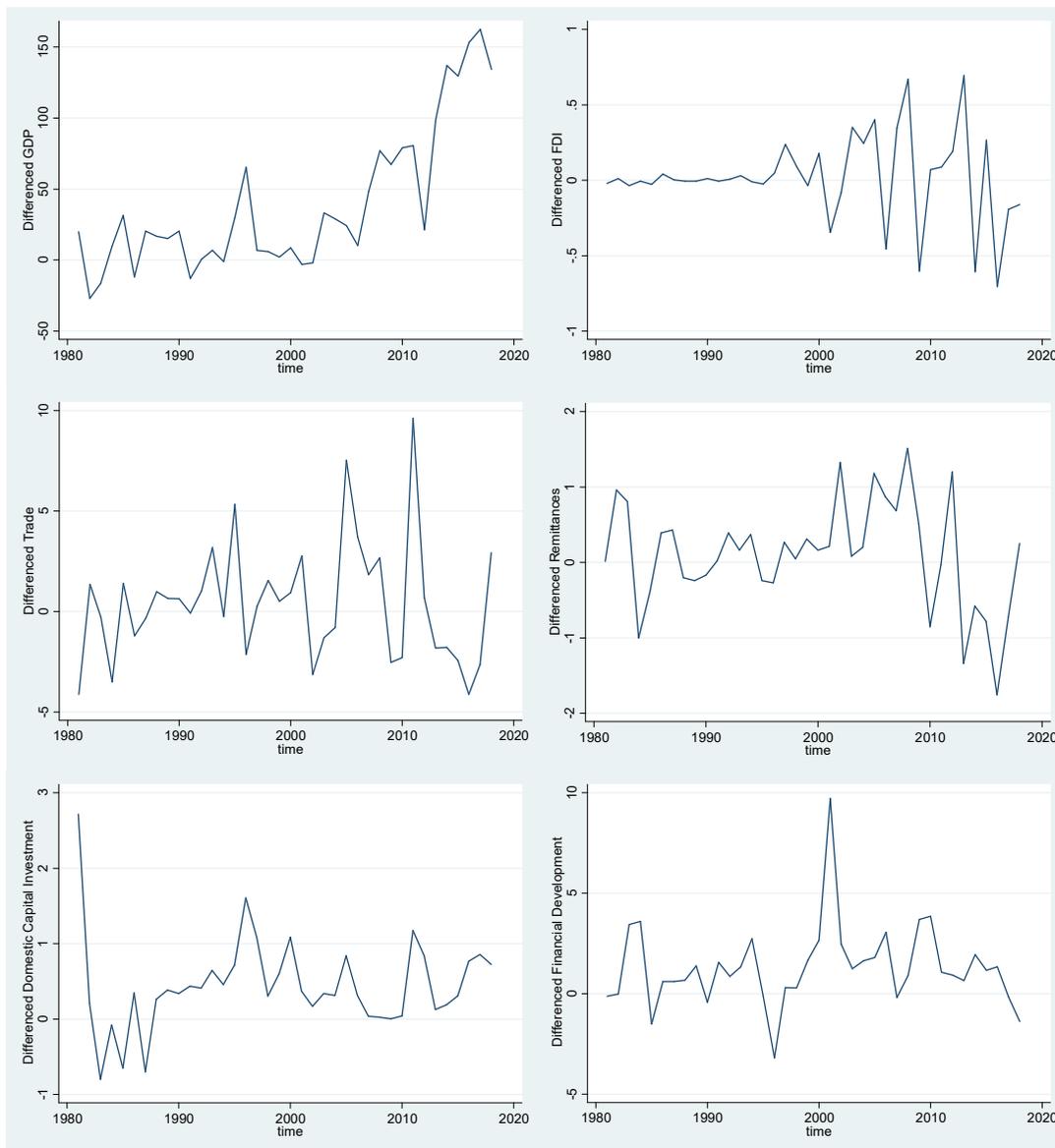

Figure 3. Time Series Plot of First Differences for Stationarity

5.1 Unit Root Test (Augmented Dickey-Fuller Test)

In this section, the Augmented Dickey–Fuller unit root test has been conducted using the first-order differences of the dependent variable, per capita GDP, as well as the explanatory variables, in order to determine whether the results for stationarity of the data are consistent with the time series plotting in Figure 3.

The hypotheses for the Augmented Dickey-Fuller test are as follows:

- H_0: There is a unit root, i.e. the time series is non-stationary.

- H_a: There is no unit root, i.e. the time series is stationary.

According to the results presented in Table 3, the Augmented Dickey-Fuller test reveals that the first-order differences of all the explanatory variables have ADF statistics (for both the intercept and intercept and trend) which are lower than their respective critical values with 0.05 level of significance. Thus, the null hypothesis is rejected for all these variables, indicating that the first-order differences of the explanatory variables are both difference-stationary and trend-stationary.

Table 3. Augmented Dickey-Fuller (ADF) Test for Unit Root

5% Critical Value (ADF Statistic: Intercept) = -2.966
5% Critical Value (ADF Statistic: Intercept and Trend) = -3.552

Variables (First-Order Differences)	ADF Statistics (Intercept)	ADF Statistics (Intercept and Trend)	Conclusion
Per capita GDP	-1.245	-3.087	Not Stationary
FDI (% GDP)	-7.791***	-7.701***	Stationary
Trade (% GDP)	-5.868***	-5.785***	Stationary
Inflation (GDP Deflator)	-4.935***	-4.980***	Stationary
Remittances (% GDP)	-4.300***	-4.340***	Stationary
Broad Money (% GDP)	-4.462***	-4.358***	Stationary
Capital Investment (% GDP)	-6.037***	-6.473***	Stationary

MacKinnon approximate p-value for Z(t): *** $p<0.01$, ** $p<0.05$, * $p<0.1$

However, per capita GDP is the only variable which has a unit root, and therefore is non-stationary even after first-order differencing (refer to Table 3). This result is consistent with the time-series plot of first differences shown in Figure 3. Hence, the second differences of the data for per capita GDP was used for further tests in the study to ensure stationarity of all data.

5.2 Regression Analysis: Ordinary Least Square (OLS) Method

Table 4 reports regression results from OLS estimation, which suggest that both foreign direct investment and trade have a positive impact on per capita GDP and are statistically significant at 0.05 and 0.1 level respectively. A one percentage point increase in the share of FDI to GDP is associated with a 0.2 percentage point increase in per capita GDP in Bangladesh. The result is consistent with previous literature; Agrawal and Khan (2011) and Sethi and Sucharita (2015).

Table 4. OLS Estimation for Effect of FDI and Trade on Per Capita GDP of Bangladesh

VARIABLES	(OLS) Per Capita GDP
Foreign Direct Investment (% GDP)	0.2036** (0.0959)
Trade Openness (% GDP)	0.0108* (0.0086)
Inflation (GDP Deflator)	0.0086* (0.0059)
Remittances (% GDP)	-0.1181*** (0.025)
Broad Money (% GDP)	0.0315*** (0.005)
Gross Capital Investment (% GDP)	0.02102* (0.0174)
Constant	4.568 (0.2119)
Observations	39
R-squared	0.9593

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Additionally, a one percentage point increase in the share of trade to GDP is associated with 0.01 percentage point increase in per capita GDP. Moreover, as expected, per capita GDP is positively associated with financial development and capital investment.

However, it is important to note that inflation is positively correlated to per capita GDP, whereas remittance inflows have a negative correlation with per capita GDP, contrary to the previous correlation results (refer to Table 2). An explanation for this may be the moral hazard problem that remittances potentially create, mostly in developing countries where families receiving remittances may experience reduced productivity or engagement in work due to the inflow of money from abroad (Chami et al., 2005).

5.3 Co-integration Test: Johansen Approach

While the OLS method for regression provides insights into the correlation of the independent variables to the dependent variable (per capita GDP), it does not account for the co-integration between the variables. Hence, a Johansen test of co-integration has been conducted in order to determine the number of co-integrating variables in the data, by identifying the first rank for which the trace statistic does not exceed the critical value. The results from the test are presented in Table 5.

Table 5. Johansen Test of Co-integration

Trend: Constant   Sample: 1982-2018

Trace Test			
Maximum Rank	**Trace Statistic**	**5% Critical Value**	**Conclusion**
0	61.2279	47.21	At most 2 co-integrating variables at the 0.05 level of significance
1	31.0336	29.68	
2	10.4481	15.41	
3	0.3402	3.76	
Maximum Eigenvalue Test			
Rank	**Maximum Statistic**	**5% Critical Value**	**Conclusion**
0	30.1943	27.07	1 co-integrating variable at the 0.05 level of significance
1	20.5855	20.97	
2	10.1079	14.07	
3	0.3402	3.76	
Observations			37
Lags			2

The results from the Johansen test suggest that, the trace statistics for the ranks 0 and 1 are higher than their respective critical values at 0.05 significance level, while the trace statistic for rank 2 is lower than its respective critical value (refer to Table 5). This implies that the model has a maximum of two co-integrating variables at the 0.05 level of significance, which means that at most two of the variables in the model have a long-term association with per capita GDP.

In addition, the maximum value statistics in the Johansen test indicate that there one co-integrating variable in the model, since the maximum statistics for rank 1 is lower than its respective critical value at 0.05 level of significance (refer to Table 5). Hence, according to the Johansen test, at least one of the variables in the model is co-integrated with the dependent variable, per capita GDP.

However, since the trace statistics consider all of the smallest eigenvalues and are usually more robust than the maximum eigenvalue statistics, it can be concluded that the model for this study has two co-integrating variables associated with per capita GDP.

5.4 Vector Error-Correction Model (VECM) Estimation

As the Johansen test provided evidence regarding the existence of long-term associations among some of the variables, it was followed by the estimation of the Vector Error-Correction Model (VECM), the results from which are presented in the following tables.

Table 6. Vector Error-Correction Model (VECM) Estimation

Error Correction	Differenced GDP	Differenced FDI	Differenced Trade	Differenced Inflation
Co-integrating Equation 1 (ce1)	0.0568 (0.3718)	-0.0078*** (0.0019)	0.0128 (0.0231)	0.0136 (0.0307)
Differenced GDP	-0.1766 (0.1544)	0.0104 (0.0077)	0.0508 (0.0958)	0.0673 (0.1274)
Differenced FDI	-4.7384 (3.1791)	-0.0054 (0.1586)	1.2453 (1.9738)	-2.0317 (2.6238)
Differenced Trade	-0.1458 (0.3395)	-0.0262 (0.0169)	0.0445 (0.2108)	0.3059 (0.2802)
Differenced Inflation	0.0834 (0.2099)	-0.0155 (0.0105)	0.0144 (0.1303)	-0.4246 (0.1732)
Constant	0.2911	0.3303	0.1428	-0.8920
R-squared	0.3049	0.4250	0.0851	0.2560
Observations				36
Log Likelihood				-285.620
Akaike Information Criterion (AIC)				17.368
Schwarz Information Criterion (SIC)				18.555

Standard errors in parentheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

According to the results from VECM estimation presented in Table 6, the coefficient of the co-integrating equation term (ce1) is negative and significant at 0.01 level only for differenced FDI, suggesting that there is a long-term relationship between foreign direct investment and per capita GDP.

Table 7. Vector Error-Correction Model (VECM): Co-integrating Equations

Variables	Co-integrating Equation 1
	(ce1)
D_per capita GDP	1
D_FDI (% GDP)	96.205***
	(23.020)
D_Trade Openness (% GDP)	-7.068***
	(1.399)
D_Inflation (GDP Deflator)	-3.268**
	(1.531)
Constant	198.218
Chi-squared	30.001***

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Following this, further results from the VECM estimation of co-integrating equations (refer to Table 7) provided the co-integration equation of the VECM:

$$GDP_{t-1} \text{ (per capita)} = 198.218 + 96.205 FDI_{t-1} - 7.068 Trade_{t-1} - 3.268 Inflation_{t-1}$$

According to the results from Table 7, the coefficient of the first-differenced term for foreign direct investment, significant at 0.01 level, indicates that a one percentage point increase in foreign direct investment as a share of GDP will increase per capita GDP by around 96 percentage points in the long-run, with a standard deviation of 23.02. However, a one percentage point increase in trade openness as a share of GDP is likely to decrease per capita

GDP of Bangladesh by 7.068 percentage points, indicating a negative association between trade and GDP contrary to most previous literature. Furthermore, the results indicate that an increase in inflation by one percentage point is expected to decrease per capita GDP by 3.268 percentage points.

Finally, a diagnostic check has been conducted with the Lagrange Multiplier test, in order to determine whether there is any serial auto-correlation with the two lags considered in this study. According to the results from the test, as shown in Table 8, it was found that the VEC model is free of the problem of serial auto-correlation since the p-values at both lags are insignificant.

Table 8. Lagrange Multiplier Test for Auto-correlation

Lag	Chi-Squared (chi2)	Degrees of Freedom (df)	Prob>chi2
1	14.2503	16	0.58007
2	13.7763	16	0.61538

H_0: No autocorrelation at lag order

Therefore, based on the results from the VECM estimation, it can be concluded that an increase in FDI will affect per capita GDP positively in the long run, whereas trade openness is likely to have a negative long-run impact on per capita GDP, despite historic data for both FDI and trade indicating a strong positive correlation with per capita GDP (refer to Table 2).

Chapter 6

Conclusion

Foreign direct investment and international trade have been two of the most important factors influencing long-term economic growth of many developing countries, especially Bangladesh, in the past few decades. Most past empirical literature have focused mainly on the effect of FDI and international trade on economic growth of emerging economies, such as the BRICS, or developing countries. Moreover, among the few research studies conducted on the relationship between FDI, trade openness and economic growth in Bangladesh, a very small percentage accounted for macroeconomic instability.

In this context, this study evaluates the impact of FDI and trade openness on economic growth of Bangladesh, accounting for macroeconomic instability along with some other significant macroeconomic variables, by expanding the time span considered in past research. The main focus of this study is analyzing the impact of FDI inflows and trade openness on economic growth, in the presence of macroeconomic instability (inflation) in Bangladesh, along with some other significant macroeconomic variables, using time series data from 1980 to 2018.

Results from the Augmented Dickey-Fuller test for unit root reveal that the first-order differences of all the variables, except for per capita GDP, are stationary. Based on that, the OLS regression analysis suggested that both foreign direct investment and trade have a positive impact, whereas remittance inflows have a statistically significant negative impact on per capita GDP, which may be due to the reduction in productivity experienced by the remittance receiving households in Bangladesh due to a regular inflow of money from overseas (Chami et al., 2005). Although the results from the Johansen's test of co-integration suggested the existence of two co-integrating variables associated with per capita GDP, based on the results

from the VECM analysis, a long run co-integrating association between FDI and per capita GDP was found.

Based on these findings, it can be concluded that foreign direct investment and trade openness have significant positive impact on economic growth of Bangladesh, with FDI having a long-run association with per capita GDP in the presence of inflation which signifies macroeconomic instability. Since a long-term relationship exists between FDI, international trade and economic growth of Bangladesh, it is crucial for the government to take correct policy measures to attract more foreign investors from both developed and other developing countries, which will eventually generate more employment opportunities within the economy and contribute to poverty alleviation. However, the policies must be framed keeping in mind the political instabilities, including corruption and terrorism, faced by this country regularly, as such phenomena have adverse effects on the overall macroeconomic performance of the country, along with discouraging potential foreign investors.

One of the limitations of this paper is that all the factors affecting economic growth could not be incorporated in this study due to lack of sufficient data for certain variables, such as human capital, in the context of Bangladesh. However, further research can be conducted on this topic incorporating the remaining factors once sufficient data becomes available. In addition, the contribution of the informal sector of Bangladesh to its economic growth can also be focused on in further research, since the informal economy in Bangladesh affects a significant proportion of the overall GDP. Finally, a similar study can be conducted based on a few South Asian countries, including Bangladesh, using panel data and incorporating a larger time span, in order to analyze the impact of certain variables on economic growth of developing countries.

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