

Determining Factors of Foreign Direct Investment: A Time Series Analysis in Bangladesh

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Abstract: If Bangladesh wants to improve its socioeconomic indicators and keep pace with its development needs, rapid industrialization is essential. But the expected industrialization process is hampered by the low rate of Investment. In the way of achieving industrial development and growth, Foreign Direct Investment (FDI) is perceived as an important tool. It has become crucial to understand what determines the level of Foreign Direct Investment (FDI) into countries because most of the developing countries of the world are focusing on attracting inward FDI. The main focus of this paper is to reveal the major determinants of FDI. Through establishing both the short run and long run relationship between FDI and four selected determinants (real GDP, trade openness, real effective exchange rates and political stability), this study has traced the major determinants of FDI inflow in Bangladesh.

Keywords: FDI; Real GDP; Trade Openness; Real Effective Exchange Rate; Political Stability; Cointegration

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I. INTRODUCTION

To keep pace with the development needs of Bangladesh, rapid industrialization is essential. But the rate of investment is low here which hampers the expected industrialization process. To bridge the gap, foreign aids and grants had been serving. The onset of globalization has brought in high levels of investment and increased trade between countries. Foreign Direct Investments (FDI) has been the major form of these investments and trade. Annual FDI flow has increased fifteen-folds from USD 55 billion in 1980 to USD 865 billion in 1999 around the globe (Nunnenkamp, 2002). In the developing countries the inflow of FDI has been about an eight-fold jump from 1982 to 1999. FDI not only increased in absolute terms⁵ but also in relative terms⁶. As FDI serves as a much needed source of finance from external economies, it is important to the 'struggling' developing economies of the world. The FDI is able to be acquired by the countries with limited capital reserves from the countries whose economies are rich in capital. FDI has been identified as a critical determinant of a developed private sector in low-income countries and also an important factor to aid poverty reduction by The World Bank⁷. FDI inflows have shown several positive effects in the economies of developing countries. Such positive effects have been in the form of employment creation, better wages and infrastructural improvements. Long-term improvements such as technological spillovers and increased competitiveness in exports, revenues, management and skills acquisitions have also been proved (Gorg, 2005).

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⁵Absolute terms are expressed as a fixed amount rather than referring to variable factors.

⁶A relative term is a term that makes two or more distinct references to objects.

⁷The World Bank is an international financial institution that provides loans to countries of the world for capital projects.

FDI takes a vibrant part of GDP acceleration in developing countries especially in Bangladesh. Empirically, the domestic economic growth and infrastructure development as well as employment generating activities are enhanced through export-oriented sectors which emerge from FDI inflow. Because of the proven positive effects of FDI, governments of rich economies strive to provide favorable conditions for investment (Lipsey, 2004). Therefore, in achieving the development of a country, high levels of FDI can be said to be an important goal. However, weak governments and institutions are often recognized as the characteristics of developing countries. Regulations, restrictions and taxation policies may not only encourage informal sectors but may also drive away foreign investments. Political turmoil in developing countries may hamper the inflow of FDI, as investors are attracted by and rely on governments to provide legal protection and the use of intellectual property rights (Du et al., 2008).

To increase the availability of foreign private capital for long-term productive ventures, Bangladesh has been undertaking policies to attract Foreign Direct Investment (FDI). Such policies are undertaken to boost the growth of GDP (Rahman et al., n.d.). In the past, Bangladesh has had fluctuating trends of FDI flows. The country was at its lowest level of FDI of a net outflow of USD 62 million after the capital market crash of 1996-1997. Due to investment by Oil Companies, the next years 1997-1998 had the highest level of FDI inflow of USD 162 million when natural gas wells were discovered. The levels of FDI have stabilized at low levels after the peak level of 1998 (Rayhan, 2009).

The remainder of the paper is organized as follows. In Section 2, the reviews of the existing literature which referred recent and previous findings of the related study is presented. Section 3 pictures the theoretical model and description of the data. Section 4 represents the econometric characteristics of the data. Econometric estimation is done in section 5 and Conclusions are annexed in section 6.

II. LITERATURE REVIEW

In responding to the opportunities of achieving a goal increasingly recognized as one of the key aims of any development strategy offered by global economic integration, a key role is played by the FDI in improving the capacity of the host country. Over the 1990s Foreign Direct Investment (FDI) has emerged as the most important source of external resources flows to developing countries and has become a significant part of capital formation in the country despite their share in global distribution continues to remain small or even declining (Kumer, N, 2002). Moosa (2005) also examined the determinants of FDI inflows in (predominantly Arab) MENA countries, which have been remarkably unsuccessful in attracting FDI. To a sample of cross-sectional data covering 18 countries he applied extreme bounds analysis and showed that the more successful countries in attracting FDI are those of growing economies, paying attention to education and research, having low country risk and that have high return on capital due to the lack of domestic investment in fixed capital. 'By bridging the gap between domestic savings and investment and bringing the latest technology and management know-how from developed countries, foreign direct investment (FDI) can play important role in achieving rapid economic growth in the developing countries (Mottaleb, 2007)'.

In the initial years after independence in 1971, Bangladesh was heavily supported by foreign aid and rehabilitation projects. The World Bank lists International Development Association (IDA) as one of the major providers of foreign aid in Bangladesh. Thus, Bangladesh has experienced an influx of foreign aid and investments from its very inception, suggesting a possible 'relationship' between FDI and economic growth. Real GDP, albeit an important one, is not likely to be the only determinant of FDI in Bangladesh. Studies by Romer (1986) and Lucas (1988) show that the long-run growth of a country is not only influenced by the magnitude of investment but also on the efficiency of managing these investments. FDI brings the organizational, managerial, technical and human skills, technological progress and knowledge spillovers that are incorporated into a country with the Endogenous Growth Models. Utilizing data on FDI flows from industrial countries to 69 developing countries over the last two decades, Borensztein et al (1998) tested the effect of FDI on economic growth in a cross-country regression framework. Their results suggest that for the transfer of technology, contributing relatively more to growth than domestic investment, FDI is an important vehicle. Moreover, it was also found that FDI is more productive than domestic investment only when the host country has a minimum threshold stock of human capital or when there is availability of sufficient absorptive capability of the advanced technologies in the host economy.

With high levels of trade openness, a country allows its factors of production to be reoriented to productive sectors in which it has comparative advantages⁸. Due to trade openness, factor endowments are better utilized (Romer, 1989). The relationship between FDI, trade openness and real exchange rates can be understood easily drawing from the theoretical framework of Endogenous Growth Models. There are direct financial flows from capital-abundant to capital-scarce countries when there is significant openness in

⁸ Comparative advantage is when a country produces a good or service for a lower opportunity cost than other countries.

international transactions (Acemoglu and Ziliboti, 1997). FDI has greater influence on economic growth when countries adopt liberalized trade policies and maintains macroeconomic stability (Zhang (2001). On the contrary, Adhikary B.K. (2011) found that the volume of FDI has a strong positive long-run relationship to changes in real GDP whereas trade openness has a negative and declining influence on GDP growth rates. ‘Domestic investment has a positive influence on economic growth and FDI and openness of trade has less significant influences on economic growth (Tabassum and Ahmed, 2014)’.

In the determination of inward FDI in countries, political and financial risk also plays a role. ‘Various factors related to political and financial risk both in the short and long runs affects FDI inflows in most of the developing countries. The political risk components of government stability, socioeconomic conditions, investment profiles, internal and external conflict, corruption, religious tensions, democratic accountability and ethnic tensions are positively related to FDI flows. The financial risk component of exchange rate stability also shows positive relationship with FDI flows. This implies that higher FDI flows into countries are led by the greater exchange rate stability. In general, financial risk has a negative relationship with FDI flows (Hayakawa et al., 2011)’. Political risk is likely to have negative effects on economies and thus, hamper the level of FDI in economies. ‘Political risk indicators have negative relationship with FDI for the world as a whole, but this relationship is strongest for high-income and upper middle-income countries (Khan and Akbar, 2013)’. Since 1971 an unhealthy political climate has prevailed in Bangladesh with constant upheavals and regime changes, making it important to look at the relationship between FDI and an ever-present non-economic factor of political stability. On the contrary, Ahmed and Habibullah (2013) researched on the impact of political stability on Bangladesh’s economic performance for the year 1984 to 2009 and have found a positive effect on economic growth in the long-run.

Malik and Pentecost’s (2007) research has used data for Pakistan from 1973 to 2004 to test the significance of the determinants of inward FDI. It was found that the level of GDP is the primary determinant of FDI in the long-run whereas, changes in the degree of political risk also determines the short-run flow of new FDI. According to Agosin and Mayer (2000), it is not assured to have positive impacts of FDI on domestic investment. Total investment may increase much less than FDI in some cases, or may even fail to rise when a country experiences an increase in FDI. On theoretical grounds, a linkage between Trade Openness, Real Exchange Rates and FDI can be seen. The countries which impose high barriers and restrictions on trade and capital flows and make it difficult for the investors to repatriate profits and capital, there the investors will not invest. The level of FDI is also likely to raise with political stability. As Pakistan has operated under a flexible exchange rate policy since early 1970s, the variable real GDP is used and Real Exchange Rate is dropped off, treating it as a strictly endogenous variable.

To sum up, the literature review suggests that for the economic growth in a developing country such as Bangladesh FDI is an important tool. It also revealed that there are contradicting perceptions, facts, and findings about the investment environment and doing business in Bangladesh. In this paper, Malik and Pentecost’s model is suitably modified to account for the country-specific factors of Bangladesh and data availability.

⁸ Comparative advantage is when a country produces a good or service for a lower opportunity cost than other

III. MODEL AND DATA DESCRIPTION

3.1 *Theoretical model:*

To check whether the determinants determine the level of Foreign Direct Investment (FDI) in Bangladesh and in what extent, the constructed model is as follow:

$$\ln FDI_t = \beta_1 + \beta_2 \ln \text{RealGDP}_t + \beta_3 \ln \text{TO}_t + \beta_4 \ln \text{REER}_t + \beta_5 \ln \text{PRI}_t + U_t$$

In the above model: FDI = Foreign Direct Investment, GDP = Gross Domestic Product, TO = Trade Openness (Exports + Imports), REER = Real Effective Exchange Rate, PRI = Political Risk

3.2 *Technical datadescription:*

Time series data of FDI inflows into Bangladesh and some selected indicators that affect FDI of Bangladesh is used from 1974 to 2016 for the analysis. World Development Indicators of World Bank, Finance Division and Bangladesh Bank were the source of most of the data. There are several numbers of independent variables which can be commonly used as determinants of FDI. However, the number of independent variables were narrowed down and those variables which have also been considered in several researches with FDI in developing countries and also in South Asia were opted (e.g. Sekkat K. and Veganzones-Varoudakis M., 2007). In finding the determinants of Foreign Direct Investment, FDI will be the dependent variable as a share of nominal GDP, which has also been used in many empirical researches (e.g. Walsh J. P. and Yu J., 2010).

However, Real GDP per capita, Trade Openness, Real Effective Exchange Rate and Political Risk have been taken as independent variables. After calculating the GDP deflator where the base year is 2000, the FDI data is converted to constant 2000 US dollars as it was found in current US dollars. In practice, real exchange rate is constructed using the following equation:

$$RER = E_t^{\$} * \frac{CPI_t^d}{\Sigma CPI_t^f}$$

Here,

$E_t^{\$}$ = The exchange rate of Bangladeshi Taka against US dollar

ΣCPI_t^f = i^{th} country's consumer price index

CPI_t^d = Bangladesh's consumer price index

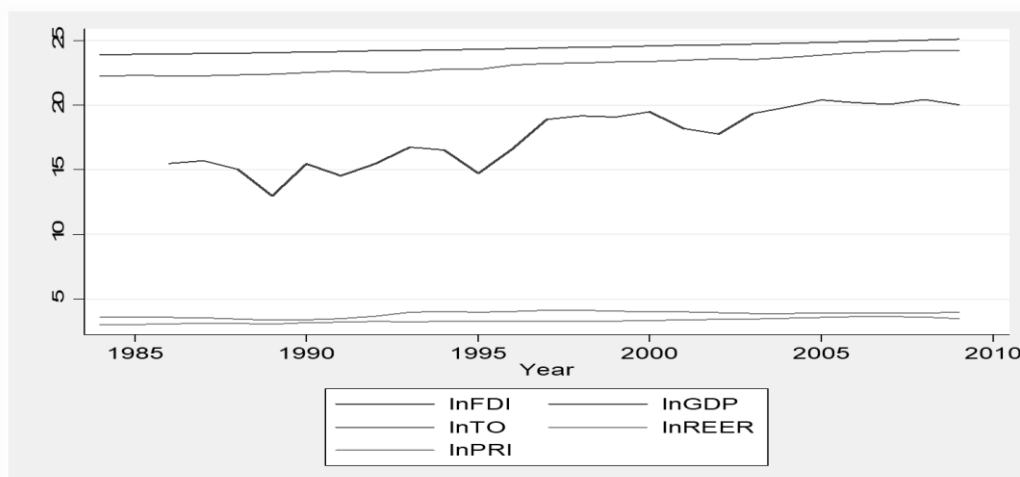
We constructed RER from the above equation and adjust it with base year 2010.

The data of political stability is sourced from PRS (Political Risk Services) group from the International Country Risk Guide (ICRG). The data is a political risk rating which is a method of assessing the political stability of countries covered by ICRG on a comparable basis. Instead of FDI stocks, annual FDI flow data is used. To account for economic growth, Real GDP is used. Real Interest Rate, the price of capital stock, for Bangladesh was replaced by Real Effective Exchange Rate. The degree of trade openness is measured as a sum of exports and imports. Instead of the Political Stability index, Political Risk is used.

IV. ECONOMETRIC CHARACTERISTICS OF DATA

The existence of a long-term relationship of time series data depends on the type of the data. That means whether the data is stationary or not. A random time series Y_t is said to be stationary (more precisely weakly stationary) if 'its means and variance are constant over time and the value of covariance between two time periods depends only on the distance between the two time periods and not on the actual time at which the variance is computed' (Gujarati, 1995, p. 714). OLS regressions may lead to spurious problems if the variables are non-stationary and computed t and F statistics will be non-standard. Depending on whether the variables are generated by a Difference Stationary Process (DSP) or Trend Stationary Process (TSP), the problems of non-stationary of time series variables are likely to arise. By a de-trending process, TSP variables can be made stationary and the DSP variables are differenced until they are stationary. To formally define the nature of the data, Unit Root tests are done.

Figure 1: Trends of the variables



In the above figure, a first-hand representation of the variables of the model in logarithmic form is shown. It can be seen from the figure that all the variables reflect a time trend on their level forms.

4.1. The F-test is in the following form:

$$\Delta Y_t = \alpha + (\rho - 1) Y_{t-1} + \chi T + e_t, \text{ with joint restriction: } \rho = 1 \text{ and } \chi = 0$$

In the above equation, ΔY_t = first-difference form of the variable under consideration, T = time trend and e_t = error term. The null and alternative hypothesis of the test is:

H_0 = the series is DSP

H_A = the series is TSP

Table 1: F-test for the variables

Variables	Computed F	Critical F	Conclusion
lnFDI	5.54	5.68	DSP
lnGDP	18.37	5.68	TSP
lnTO	4.33	5.68	DSP
lnREER	2.00	5.68	DSP
lnPRI	0.69	5.68	DSP

From the Dickey-Fuller tables, 5% Critical F values for a sample of 25 observations is 5.68

The critical F values are for the joint hypothesis that the constant, trend and $(\rho-1)$ are equal to zero. The Dickey-Fuller and Augmented Dickey-Fuller tests are the two popular unit root tests.

4.2 The Dickey-Fuller test is in the following form:

$$\Delta Y_t = \alpha + (\rho-1) Y_{t-1} + \chi T + \epsilon_t, \text{ with joint restriction: } \rho=1 \text{ and } \chi=0$$

From the above equation we can see that the equation is same with the F test equation. The null and alternative hypothesis of the test are:

$$H_0: (\rho-1) = 0, Y_t \text{ is non-stationary}$$

$$H_A: (\rho-1) < 0, Y_t \text{ is stationary}$$

The null hypothesis of non-stationarity is accepted if the absolute value of t statistic is less than the critical value for a given level of significance, otherwise the alternative hypothesis of stationarity of Y_t is accepted. The t test provides the estimated coefficient to determine unit root.

4.3 The Augmented Dickey-Fuller test is in the following form:

$$\Delta Y_t = \alpha + (\rho-1) Y_{t-1} + \chi T + \delta \Delta Y_{t-1} + \epsilon_t$$

The modification of the Dickey-Fuller test is the Augmented Dickey-Fuller test. To ensure that the error process in the estimating equation has uncorrelated residuals, it involves augmenting the equation of the Dickey-Fuller test by the lagged values of the variable. The null and alternative hypothesis for this test is the same as DF test. That is:

$$H_0: (\rho-1) = 0, Y_t \text{ is non-stationary}$$

$$H_A: (\rho-1) < 0, Y_t \text{ is stationary}$$

Another ADF unit root test can be performed on its first difference ΔY_t if it happens that Y_t is found to be non-stationary. By substituting Y_t by ΔY_t in relation and Y_{t-1} by ΔY_{t+1} this is done. A relation akin to or any of its variants can be derived and estimated after that. When a time series is not stationary but its d^{th} difference is, it is said to be integrated of order d or to follow an I(d) process. It is important to make sure that all the variables follow the same process in running regression on time series, otherwise, the results of the regression will be spurious. For cointegration, this is a necessary condition.

Table 2: DF and ADF tests for unit root

Variables	DF	ADF
lnFDI	-1.178	-3.671**
DlnFDI	-5.256*	-5.125*
lnGDP	5.712	-0.882
DlnGDP	-2.828***	-4.661*
lnTO	0.310	-3.115
DlnTO	-5.088*	-5.145*
lnREER	-1.153	-2.317
DlnREER	-3.012**	-2.916
lnPRI	-1.036	-1.569
DlnPRI	-2.486	-3.260***

***, **, *** indicates 1%, 5% and 10% Dickey-Fuller critical values respectively**

To identify if a time series variable is stationary or non-stationary, we use unit root tests. As the data available in this case is small; so is the size of the sample, ‘autocorrelation and correlogram can be used to check the stationarity of the variable (Hall, 1989)’. For any variable at any lag, the sample autocorrelation function is the ratio of covariance at that lag and variance. That is,

$$\text{Autocorrelation at lag } k = \text{Covariance at lag } k / \text{Variance}$$

To obtain the correlogram, estimated correlation coefficients are plotted against the lags. Correlograms die down slowly for non-stationary variables giving rise to either a secular declining or a constant trend in the graph of autocorrelation coefficients while they damp down almost instantly in the case of stationary variables and then show random movement.

Sample autocorrelation coefficients would be normally distributed with zero mean and standard error = $1/\sqrt{n}$ if a

series is stationary, here n is the number of observations. Since the number of observations is 43 here, the standard error = 0.152496. Now, according to the properties of the standard normal distribution, the 95 % confidence interval for any of the sample autocorrelation coefficient will be $\pm 1.96(0.152496) = \pm 0.299$. If the autocorrelation coefficient falls inside the 95% confidence interval, we can accept the null hypothesis that the true autocorrelation coefficient is zero.

\ln FDI; as the calculated test statistic for its first difference form can be rejected at the 1% critical level, it is an integrated order of $I(1)$ process. Hence \ln FDI is stationary in its first-difference form. The correlograms of the variable \ln FDI also support this finding.

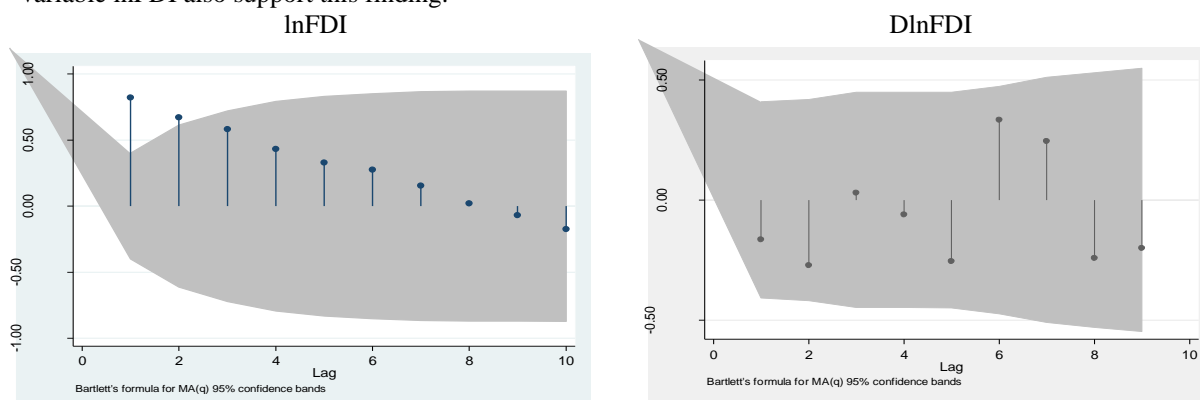


Figure 2: Correlograms of FDI

Spikes and gradual decay are seen in the correlogram of \ln FDI, whereas all the spikes are within the 95% confidence interval level in its first difference form, suggesting stationarity.

\ln GDP is an integrated order of $I(1)$ process and the calculated test statistic tells us that the null hypothesis can be rejected at 1% critical level. This is stationary in its first-difference form and the correlogram also support this claim.

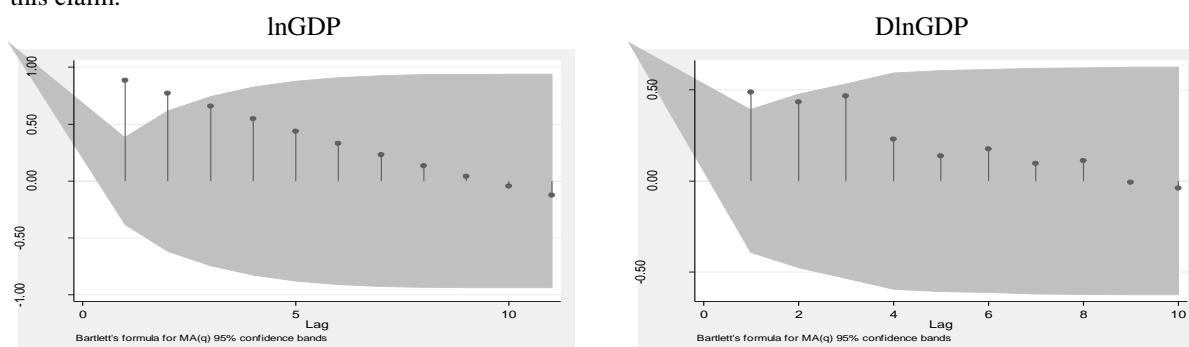


Figure 3: Correlograms of GDP

It can be seen that there are spikes and gradual decay in the correlogram of \ln GDP but when the first-difference of \ln GDP is taken, the spikes are within the 95% confidence interval. Though there is a slight spike, we have rejected the null hypothesis at the 10% level for unit root in the Dickey-Fuller test. The ADF test however, confirms that \ln GDP is of $I(1)$ process.

\ln TO is also an integrated order of one or $I(1)$ process and the null hypothesis can be rejected for both the DF and ADF tests at the 1% critical level for unit root in its first-difference form. Again, it can be seen from the correlogram of TO that the first difference of \ln TO is stationary while \ln TO is non-stationary.

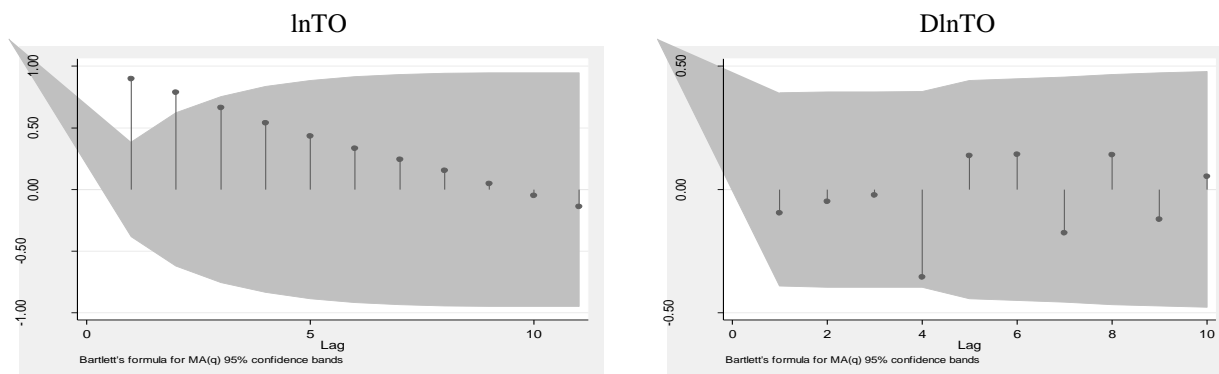


Figure 4: Correlograms of TO

lnREER is again an integrated order of one or I(1) process as the DF test's null hypothesis for unit root can be rejected at the 5% critical level for the first-difference of lnREER.

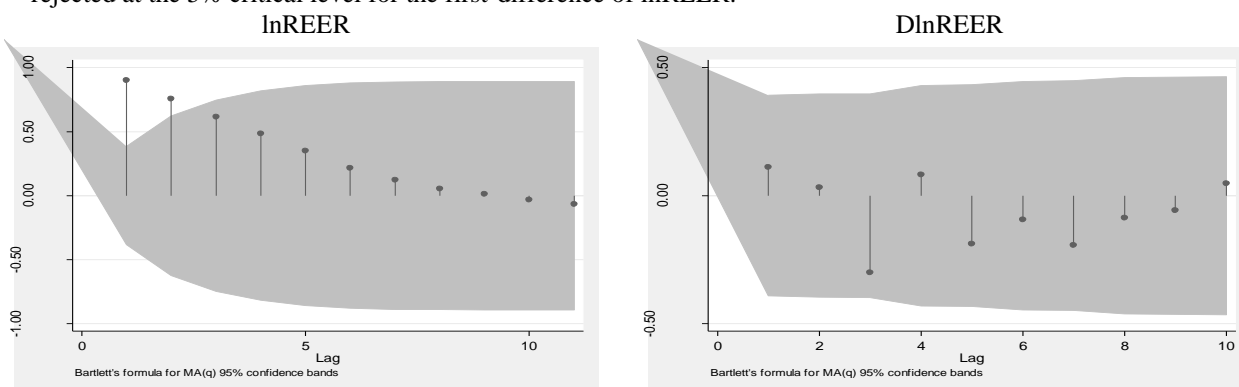


Figure 5: Correlograms of REER

Although the null hypothesis cannot be rejected for unit root in the first-difference of lnREER using ADF test, the correlograms support that the process is of I(1). All the spikes are seen to be inside the 95% confidence interval for first-difference of lnREER.

Lastly, lnPRI is an integrated order of one or I(1) process as the null hypothesis can be rejected at the 10% critical level for unit root in the first-difference of lnPRI. For the lower power of ADF tests, the 10% level is chosen. It can also be seen from the correlograms that lnPRI is an I(1) process.

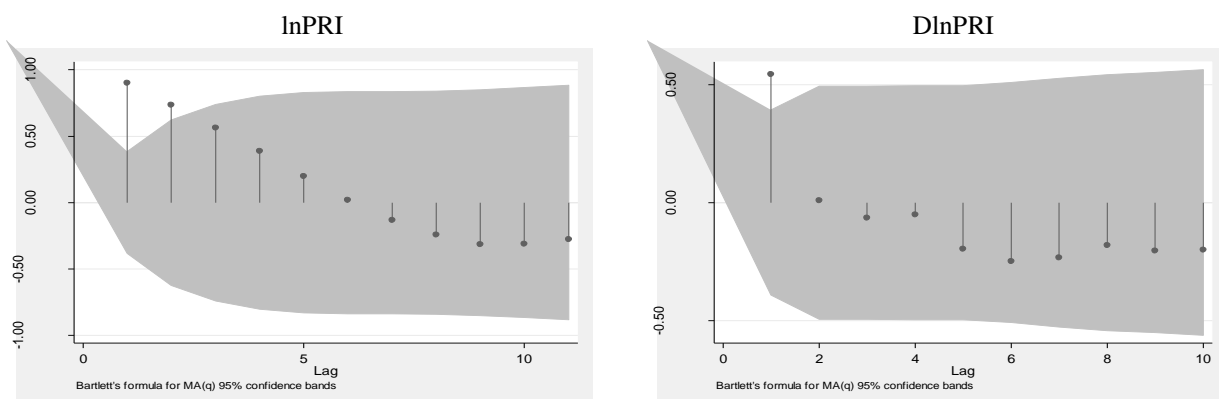


Figure 6: Correlograms of PRI

V. ECONOMETRIC ESTIMATION

It must be kept in mind while conducting unit root tests that the data available for these variables is for a mere 43 years. In the computation of tests, the small sample poses difficulties and the rejection of the null hypothesis of unit roots are often made difficult by the low power of tests. On the basis of Schwarz Bayesian Information Criterion (SBIC) appropriate lags of variables are selected. Now, as the variables in their level forms are identified to be non-stationary and stationary in their first-difference forms, applying cointegration techniques is the only way to infer about long-run relationships between them.

As we saw that all the variables are non-stationary in their level from so now, to find out a valid long run relationship among them the variables we need to apply cointegration techniques. Two types of cointegration estimation procedure; the Engle Granger Procedure and the Granger Causality test are used here to find out the valid long run relationships.

5.1 The Engle-Granger Procedure

Two or more series are said to be cointegrated if the series are individually integrated but some linear combination of them has a lower order of integration. In an exceptional case, Engle and Granger showed that the linear combination of two I (d) variables can be found to be integrated of a lower order than d. That means, if two time series x_t and y_t are cointegrated, a linear combination of them must be stationary. In other words, $y_t - \eta x_t = v_t$, where v_t is stationary.

The common stochastic trends of the variables in this situation will be canceled out. Removing the spurious regression possibility, OLS estimation will give valid long run relationships and the variables are said to be cointegrated. It has already been established that all the variables in the model are of I(1) processes, so the Engle-Granger equation is as follows:

$$\ln FDI = - 39.499 - 0.627 \ln GDP + 2.511 \ln TO + 1.720 \ln REER + 2.218 \ln PRI$$

$$\text{Adjusted } R^2 = 0.8154$$

$$\text{Durbin-Watson D-stat} = 1.474831$$

Using Cointegrating Regression Durbin-Watson (CRDW), an initial check of cointegration can be done. The critical d-value, computed from the Durbin-Watson D-statistic table at 1% level of significance is 0.805 and the computed D-stat is greater than this value. Thus, the null hypothesis of no cointegration can be rejected.

But the standard method to check for cointegration in the variables is to apply the Augmented Dickey-Fuller tests on the residuals in the following form:

$$\Delta E_t = (\rho - 1) E_{t-1} - \delta \Delta E_{t-1} + v_t$$

The result of the ADF test on the residuals gives a computed t value of -3.653. At 5% level of McKinnon critical value, the null hypothesis of no cointegration can be rejected.

Again, the correlogram test of the residuals are done because of the small sample size. It is also seen from the figure that the error bars are within the 95% confidence interval region.

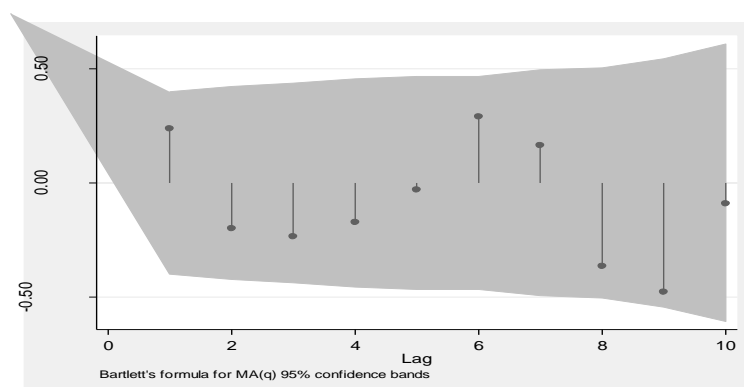


Figure 7: Correlogram of Residuals

In table 3 the autocorrelation coefficients and Box-Pierce Q-stat is given. It can be seen that at 95% confidence interval all of the autocorrelation coefficients are individually statistically significant.

Table 3: Autocorrelation Coefficients of Residuals

Lags	Autocorrelation Coefficient	Box-Pierce Q-stat
1	0.2389	1.5487
2	-0.1984	2.6657
3	-0.2350	4.3062

4	-0.1711	5.2194
5	-0.0301	5.2493
6	0.2900	8.1642
7	0.1640	9.1519
8	-0.3639	14.317
9	-0.4777	23.811
10	-0.0909	24.179

All the tests suggest that the null hypothesis for no cointegration can be rejected and a long-term relationship can be inferred among the variables.

5.2 Short-run dynamics of Engle-Granger Procedure

If variables are cointegrated, an Error Correction Model (ECM) of the cointegrating relationship exists (Engle and Granger, 1987). The short-run dynamics of the long-run behavior of the variables are captured by this ECM. The second step of the Engle Granger procedure is this process.

By regressing the dependent variable in its stationary form onto its own lagged values and ‘current and lagged values of the independent variables’ and the lagged values of the residual obtained in the cointegrating relationship; the ECM is constructed. Using Schwarz Bayesian Information Criterion (SBIC), Lag order is chosen as the sample is small.

The ECM equation is thus, as follows:

$$\Delta \ln FDI = 21.589 - 1.098 \Delta \ln GDP (-1) + 0.393 \Delta \ln TO + 4.842 \Delta \ln REER - 2.421 \Delta \ln PRI (-1) + 3.366 \Delta \ln PRI (-2) - 0.533 \Delta RES (-1)$$

The value of the coefficients of the error correction term is correctly signed; meaning that for the disequilibrium to be corrected, it takes slightly more than half a period. The estimated coefficients are not statistically significant in the short-run, except political risk which can be seen by the following table.

Table 4: Estimated Model (Short-Run)

Variables	Estimated Coefficients (t-ratio)
Intercept	21.589 (0.80)
$\Delta \ln GDP (-1)$	-1.098 (-0.92)
$\Delta \ln TO$	0.393 (0.20)
$\Delta \ln REER$	4.842 (0.85)
$\Delta \ln PRI (-1)$	-2.421 (-0.93)
$\Delta \ln PRI (-2)$	3.366 (1.09)
$\Delta RES (-1)$	-0.533 (-2.19)

5.3 Granger Causality test

To examine if the past value of a series X_t will help to predict the value of another series at present Y_t , the Granger causality tests are used. When Granger causality holds then we can say X might be causing Y . To see if there is a causal relationship between FDI and Political Risk, the Granger Causality tests have been run. The relationships we are testing are as follows:

$$\Delta \ln FDI_t = \alpha + \sum \delta_i \Delta \ln FDI_{t-i} + \sum \rho_i \Delta \ln PRI_{t-i} + v_{1t}$$

$$\Delta \ln PRI_t = \alpha + \sum \delta_i \Delta \ln PRI_{t-i} + \sum \rho_i \Delta \ln FDI_{t-i} + v_{2t}$$

By regressing the dependent variable on lagged values of itself and the lagged values of the independent variable it is checked if one variable ‘granger-causes’ the other. Using the classical F-test, the joint significance of coefficients of the causal variables is checked. The results of the F-test are given below.

Table 4: F-test for Granger Causality

Equation	F (Prob>F)	Decision
$\Delta \ln FDI = \alpha + \sum \delta_i \Delta \ln FDI_{t-i} + \sum \rho_i \Delta \ln PRI_{t-i} + v_{1t}$	F (2, 19) = 0.66 (0.5267)	Cannot reject null hypothesis
$\Delta \ln PRI = \alpha + \sum \delta_i \Delta \ln PRI_{t-i} + \sum \rho_i \Delta \ln FDI_{t-i} + v_{2t}$	F (1, 19) = 0.01 (0.9373)	Cannot reject null hypothesis

The null hypothesis here is that the lags of the independent variables are statistically different from zero. We cannot reject the null hypothesis for the first equation that the lags of $\ln PRI$ are statistically different from zero. The F-test is not significant. Therefore, political risk does not ‘granger-causes’ the level of FDI in Bangladesh or the level of FDI in Bangladesh cannot be predicted by the level of political risk.

The second equation also does not show a causal relationship between political risk and FDI.

Suggesting that FDI does not ‘granger-cause’ political risk in Bangladesh, the null hypothesis is rejected. So it can be said that there is no short-run causal relationship between FDI and Political Risk in Bangladesh.

VI. CONCLUSION

To find out the major determinants of FDI in Bangladesh using Econometric analysis is the main purpose of this study. FDI has been considered more favorable factor for Bangladesh in stimulating economic growth. During the 1970s and 1980s there was dire straits of extreme poverty in our country, it remained poor with very low income per capita. Growth and development have been stifled by such inadequacies. Our country is performing much better than those times now and FDI has contributed a lot in that path. In this study the econometric results show that there exists long run relationship among the selected variables, considering the order of integration among the variables and depending on the various test approach.

It is found in our study that trade openness has positively influenced FDI and it plays the most important role in attracting FDI among the four selected variables in Bangladesh. It indicates that foreign investors in this country were encouraged by trade related policies. The increased volume of FDI flow to Bangladesh also reflects this, particularly since policy reforms were introduced in the 1990s. There are some interrelated administrative barriers though, resulting inferiority in policy formulation and implementation. Some initiatives should be taken to improve the present scenario of FDI such as, ensuring accountability and transparency, developing diplomatic relations, maintaining coordination among dynamic and independent government agencies and devoting efforts to shift FDI track; ensuring power and energy supply etc. The domestic investment rate should be increased to boost foreign investors’ confidence and encourage them to invest in Bangladesh. To take a strong place in the mind of foreign customers, Bangladesh Government and other related bodies should take corrective actions.

However, it might be helpful in formulating policies and enhancing government interventions according to the findings of this study which shaded light on the extent at which selected determinants influence the inflow of FDI in Bangladesh. Thereby, there would have been firm commitments to implement aforesaid policy suggestions and other up to date policy issues and hence the country can be a favorable destination of foreign investment. Therefore, FDI is pivotal to achieve sustainable growth as well as poverty alleviation, providing Bangladesh the necessary finance and capital. GDP has been increased by raising the economy’s output capacity and full employment level with the help of FDI inflows. At the same time, per capita income levels has improved which has also delivered development. In the way of the country’s becoming more export-oriented and continuing on its quest for development, all these enhancement have contributed a lot. Overall, to realize higher growth levels by utilizing all its resources to their fullest potential and to progress further, the necessary tools for Bangladesh are provided with the help of FDI

REFERENCES

- [1]. Accolley, Delali (2004). ‘The Determinants and Impacts of Foreign Direct Investment. ‘Department of Economics, London Metropolitan University.
- [2]. Adhikary B.K. (2011). ‘FDI, Trade Openness, Capital Formation and Economic Growth in Bangladesh: A linkage’.
- [3]. Agiomirgianakis, G.M., Asteriou, G., and Papatoma, K. (2003). ‘The determinants of Foreign Direct Investment: A panel data study for the OECD countries.’ *Discussion Paper Series*, City University, London.
- [4]. Agosin, M. R., Mayer, R. B. (2000). ‘Foreign Investment in Developing Countries: Does it Crowd in Domestic Investment?’ Discussion Paper no. 146, United Nations Conference on Trade and Development (UNCTAD), Palais des Nations, Geneva, Switzerland
- [5]. Ahamad M.G. and Tanim F. (2010). ‘Determinants of and the Relationship between FDI and Economic Growth in Bangladesh.’ MPRA Paper No. 20236.
- [6]. Asiedu, E., (2002). ‘On the determinants of Foreign Direct Investment to Developing Countries: Is Africa different.’ *Journal of World Development*, Vol.30, No.1, pp.107-119. Bangladesh Bank (various years), *Annual Report*, Dhaka: Bangladesh Bank.
- [7]. Aziz N. (2010). ‘Real and Nominal Effective Exchange Rates Data for Bangladesh.’
- [8]. B. Shahmoradi and M. Beghbanyan (2011). ‘Determinants of Foreign Direct Investment in Developing Countries: A Panel Data Analysis.’ *Asian Economic and Financial Review*, I (2), 49-56.
- [9]. Borensztein, E., J. De Gregorio, and J.W. Lee (1998). ‘How Does Foreign Direct Investment Affect Economic Growth?’ *Journal of International Economics* 45, p.115–135.
- [10]. Hossain F. and Kimuli C.K. (2012). ‘Determinants of Foreign Direct Investment Flow to Developing Countries.’ *S BP Research Bulletin*, 8(I).
- [11]. Hossain R. (2015). ‘Foreign Direct Investment on Bangladeshi Garments and textiles Sector: An overview of the foreign ownership in Bangladesh Garments and textiles.’ SEINAJOKI UNIVERSITY

OF APPLIED SCIENCES

- [12]. J. P., Agarwal. 'Determinants of Foreign Direct Investment.' *Weltwirtschaftliches Archive*, 4(116), 739-73, 1980.
- [13]. J. P. Walsh and J. Yu (2010). 'Determinants of Foreign Direct Investment: A sectorial and Institutional Approach.' IMF Working Paper, WP/10/187, Asia Pacific Department, International Monetary Fund.
- [14]. K. Sekkat and M. Veganzones-Varoudakis (2007). 'Openness, Investment Climate FDI in developing countries, Review of Development Economics.' *Blackwell Publication*, Oxford 11(4), 2007, 607-620.
- [15]. Martin C., Veazquez F. J. (1997). 'The determining factors of foreign direct investment in Spain and the rest of OECD: lessons for the CEECS.' CEPR, 1937.
- [16]. Malik and Pentecost (2007). 'A Time Series Econometric Model of determinants of the level of Inward Foreign Direct Investment into Pakistan'.
- [17]. Moosa, I.A. and Cardak, B.A. (2005). 'The Determinants of Foreign Direct Investment: An Extreme Bounds Analysis'. *Journal of Multinational Financial Management* (forthcoming)
- [18]. Mottaleb, Abdul K. (2007). 'Determinants of Foreign Direct Investment and Its Impact on Economic Growth in Developing Countries.' MPRA Paper 9457, University Library of Munich
- [19]. Nunnenkamp, P. (1997). 'Foreign direct investment in Latin America in the era of globalized Production.' *Transnational Corporations*, Vol. 6, No. 1, pp. 51-81.
- [20]. Mottaleb K. A. and Kalirajan K. 'Determinants of Foreign Direct Investment in Developing Countries: A Comparative Analysis.' *The Journal of Applied Economic Research* 4(4), Sage Publication, 2010, 369-404.
- [21]. Nasrin S., Baskaran A. and Muchie M. (2010). 'A Study of Major Determinants and Hindrances of FDI inflow in Bangladesh.' Working Paper no. 144. DIR & Department of Culture and Global Studies, Aalborg University.
- [22]. Quader S.M. (2009), 'Foreign Direct Investment in Bangladesh: An Empirical Analysis on its Determinants and Impacts.' MPRA Paper No. 26134.
- [23]. Shah N. (2013). 'Determinants of Foreign Direct Investment: A Study on Bangladesh.' *Journal of Economics and Sustainable Development*, Vol. 4, No. 18
- [24]. Shaheena D. (2014). 'FDI inflows in Bangladesh: Identifying its major Determinants.' *IOSR Journal of Economics and Finance*, PP 01-13
- [25]. Sahoo P. (2006). 'Foreign Direct Investment in South Asia: Policy, Trend, Impact and Determinants.' *ADB Institute Discussion Paper*, No. 56.
- [26]. Sethi D., Guisinger S. E., Phelan S. E. and Berg D. M. (2003). 'Trends in foreign direct investment flows: a theoretical and empirical analysis.' *Journal of International Business Studies*, 34, Palgrave Macmillan Ltd, 2003, 315-326.
- [27]. Wint, A. Z., and Williams, A. D. (2002). 'Attract FDI to developing countries: A changing role for Govt.' *International Journal of Public Sector Management*, Vol. 15, No. 5, pp. 361-374. World Economic Forum (2008-2009), *the Global Competitiveness Report 2008-09*, Geneva.
- [28]. Zheng, P. (2009). 'A Comparison of FDI Determinants in China and India.' *Thunderbird International Business Review*, Vol. 51, No. 3, pp. 263-279.

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