Impact of Selected Determinants on Foreign Direct Investment (FDI) in Bangladesh: An Empirical Study Based on Panel Data

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This study analyzes the impact of some selective macroeconomic factors on FDI as it plays a vital role in any country’s economy. In this study, based on previous literature, we have selected GDP, inflation rate, interest rate and corporate income tax as determinants. We investigate empirically the impact of those macroeconomic variables on FDI. Panel data has been collected from three global and local sources for analysis. Total 29 observations from 1987 to 2015 for each variable have been analyzed to show the effect of the independent variables using regression model. Overall, the model was found to have significant predictability over FDI. The empirical result also revealed significant impact of GDP and corporate income tax on FDI individually, while inflation and interest rate were found statistically insignificant. The descriptive statistics and correlation coefficients matrix also observed to investigate the relationship among the dependent and selective independent variables. FDI helps to upgrade the socioeconomic condition of the country and hence, to compete in a competitive world, investment friendly policy adoption, enhanced infrastructure and improvement of overall investment climate are essential for Bangladesh to ensure the growth of FDI journey and ultimately foster the economic development journey.

INTRODUCTION

Foreign Direct Investment (FDI) is recognized as one of the important factors for the development of any economy. In this era of globalization, exchanging views, ideas, human resources, technologies, capital have become vital. Bangladesh is in emerging state of her economic development, where FDI is assumed to play a crucial role in such development process. The aim of the study is to analyze the effect of various macroeconomic variables on FDI in Bangladesh over the year.

FDI is a direct investment in any business operation to a foreign country. When a firm invests directly in facilities in a foreign country in order to produce and/or market a product, this is called FDI. A firm undertaking FDI, becomes multinational, as it operates or links it business transcending the domain of a country. The two main forms of FDI namely are green-field investment and acquisition or merger. The green-field investment involves in the establishment of a wholly new operation in a foreign country, whereas, acquiring or merging involves with an existing firm in the foreign country. According to the nature of historical data it suggests that the merging or acquisition occurs more than the green-field investment (Hill, 2005). Basically, FDI means horizontal and vertical FDIs. Horizontal FDI happens
when MNC duplicate the same activities in multiple countries. This is an investment that a firm operates in the same industry as it operates at home. On the other hand, when firms are engaged in different stages of production in multiple countries is called vertical FDI. Vertical FDI has two forms; backward vertical FDI that provides inputs for a firm’s domestic production process and forward vertical FDI, which involves in selling the outputs of a firm’s domestic production in abroad. The horizontal FDI creates more magnitude than the vertical FDI.

FDI plays a significant role in accelerating the economic growth of a country (Mottaleb, 2007). FDI helps a country to adopt new technologies, increasing managerial capability, creating job opportunities, developing infrastructure etc. As a developing country, Bangladesh requires more investment in order to accelerate the economic growth. FDI contributes in such growth positively. The socio-economic environment, political attributes and economic policies in a country play crucial role to attract FDI. Bangladesh is also trying to make more investment friendly environment to attract more inward FDI. There are different factors, which affect the FDI in a country. Various macroeconomic determinants like smooth GDP growth and significant government expenditure may ensure good infrastructure for the investment. Besides, tolerable inflation rate, corporate income tax and interest rate make a country as favorable investment destination for the investors. In comparison with other Asian countries, Bangladesh has lower labor cost. But it is also a fact that investors are normally attracted with the size of local market more besides considering low labor cost and socio-economic stability of a country. Bangladesh is a large local market for various products which supports to create attention from investors and hence supported to be translated in FDI inflows.

**REVIEW OF LITERATURE**

Foreign Direct Investment (FDI) plays a vital role as a significant determinant of economic growth through transferring technology, creating job opportunity to a country. World Investment Study (2006) defines FDI as an investment that involved with a long-term relationship interest and control by a resident entity of a country (parent enterprise) in an enterprise resident in another country (foreign affiliate). Organization for Economic Co-operation and Development (OECD, 2008) referred FDI as the key to international economic integration. OECD depicts direct investment is a category of cross-border investment made by an entity with the objective of establishing lasting interest to another economy transcending own boundary. FDI evolves to create profit by involving directly in the management of foreign companies or establishing a new company in a host country (Park, 2014), while expected to be long lasting rather than temporary (Tsukurau et al., 2015). FDI has grown rapidly in the recent years and the globalization of the world economy has a positive impact on the FDI volume. FDI is one of the most dynamic phenomena (Baltagi et al., 2007). After the development of globalization and its significance is increasing rapidly (Cela, 2017), which not only rises up the economic condition of the host country but also gives access to newer technologies (Kisswani et al. 2015). As an important source of capital investment and thus determinant for the economic growth rate of the country’s economy, capital investment in factories, stores, office buildings etc are accumulated as a significant percentage of gross fixed capital formation. FDI inflows can express as a percentage of gross fixed capital formation.

In general, the volume of FDI inflow in Bangladesh has been increasing over the years, but in the year 1989 and 1995 the volume had down turn from the previous years and kept an ascending trend with some ups and downs from the year 1996 to 2009 (See Appendix). Afterword till 2015 the trend is going with an average increasing pattern. The last decade blessed with increased FDI volume than earlier as a consequence of adopting several policy measures by the government. FDI net inflows are the value of inward direct investment which includes reinvested earnings, intra-company loans, and net repatriation of capital and repayment of loans.

The components of FDI in Bangladesh were fluctuating considerably in the last decade. Equity capital has contributed the bigger part of FDI inflows, but in the recent years, the reinvested earnings had occupied larger portion. In 2014, between October to December the inflows of reinvested earning went down negative which might be assumed due to political instability. In support to the ‘Open Door Policy’
Bangladesh government has already established eight EPZ in the country. Whereas, building 100 economic zones are underway. Still, the FDI inflows to the EPZ areas were always in a steady condition although from 2001 to 2003, the flow decreased. In 2010, the FDI inflows in Non-EPZ area was recorded to 795.15 million US$, that is 87% of total inflows (See Appendix).

Agriculture and Fishing is one of the major sectors of FDI inflows in Bangladesh. Graph 4.4 (See Appendix) shows the summarized data for major sectors of FDI inflows in Bangladesh from 1995-96 to 2015-16. According to Bangladesh Bank Survey Study, 2016 Bangladesh receives 36.57 million US$ from this sector. The manufacturing category there includes food products, textile and wearing, pharmaceuticals, vehicles and machinery etc. In 2015-16 manufacturing sector accounted for 825.85 million US$. Textile and wearing contributed the major portions of this division. Trading, banking, insurance and Non-Banking Financial Institutions (NBFI) include in the trade and commerce group and obviously banking shares the major pie. Telecommunication also contributes a significant portion which is accounted for 267.12 million US$ in 2015-16.

Till now, more than 70 countries have invested in Bangladesh where the neighboring countries have a significant share. According to the Bangladesh Bank Survey 2016, Bangladesh receives most FDI from USA in 2015-16, that is 449.74 million US$. Although overall, UK has invested most among all the countries. Other major investing countries are Singapore, Hong Kong, India, South Korea, Malaysia and Netherland. Bangladesh received 306.96 million US$ from UK, 138.49 million US$ from South Korea, 132.34 million US$ from Singapore, 126.90 million US$ from Hong Kong and 88 million US$ from India in 2015-16 (See Appendix).

UNCTAD (1998) analyzes the FDI’s determinants and classified into three categories which includes political factors, business facilitation and economic factors. Based on historical evidence, Tsurkanu et al. (2015) said that FDI influenced by larger economic, political and technological environment whereas, Demirhan and Masca (2008) mentioned market size, openness, labor costs and productivity, political risks, infrastructure, growth and tax as important determinants of FDI. According to Dunning cited in Manhal (2005), four significant major categories of factors that influence firm’s FDI decisions are trade barriers, market factors, investment climate in the host countries and cost factors. Mottaleb (2007) argued that FDI takes a vibrant part of GDP acceleration and rapid economic growth in developing countries like in Bangladesh, on the other way Ahmed et al. (2010) concludes FDI inflows are attracted by some significant determinants like GDP per capita, foreign reserve, human capital, average growth rate of GDP, gross capital formation and others important infrastructure. According to Lim (2001), among various determinants of FDI, economic and political stability, quality of infrastructure, size of the market, free trade zones are most important, whereas as consequence, FDI increases exports volume, creates access to international markets and currencies, decreases bank loans, increases the foreign exchange earnings and incomes, creates employment opportunities (Huang et al, 2014). It is fact that unstable political condition always decreases the FDI inflows (Schneider and Frey, 1985) and the political unrest situation; frequently changing economic policy and conflict may make the countries unable to attract more investments (UNCTAD, 2002).

Previous researches linked FDI explores several factors. Evans, Cooper and Landefeld (1997) referred corporate profit as one of the most significant indicators, while corporate tax is considered always has an adverse impact on investment (Djankov et al., 2010). According to Matei and Pirvu (2010), relaxed tax environment may attract major inflows of FDI to a country which also supports the notion of Bellack and Leibrecht (2009) that tax–lowering strategies seem to influence the investment decisions of the MNCs. Cela (2017) didn’t find an expected relationship of the corporate tax with FDI inflows. He argues that lower corporate income tax may not always show the expected negative relationship with the FDI inflows, if the political stability and infrastructure are present, which also supports the notion of Tang et al. (2014) that the impact of social uncertainty on investment decision is greater than the macroeconomic uncertainty that is reflected in World Investment Study-(2017) that the prospects of FDI can be hampered by geopolitical uncertainty. In 2016 the corporate income tax rate for public listed company was 25%; for bank and financial institutions it was 42.5% and 40% if publicly traded; for mobile Phone Companies and cigarette Manufacturing Companies the rate was 45% and for rest of the
companies the rate was 35% (See Appendix). For this study, I took the corporate income tax rate of the listed companies. The corporate income tax rate in Bangladesh has been decreasing over the years. It was 45% in 1987, which became 27.5% in 2015 (See Appendix).

According to Mahadika et al. (2017), GDP and FDI have a long-term relationship which supports the findings of casual relationship (kosztoniak, 2016); bidirectional causality (Roméo, 2015); and a causal relationship in respect to Bangladesh (Mortora and Das, 2007; Manhal, 2005). Johnson (2006) demonstrated that FDI inflows and GDP of host country have positive relationship in developing countries, but not in the developed countries. Ahamed et al. (2010) argues that FDI generates economic growth which supports Mahadika et al. (2017) of economic prosperity and Almfraji and Almsafir (2013) of a power of affecting economic growth. But on the other way, GDP or economic growth is a strong determinant of FDI, which validates Johnson (2006) that economic growth increases FDI inflows and Shahrudin et al. (2010) that potential GDP growth seems to receive more FDI. But, FDI’s positive impact on economic growth depends on the local economy and absorption capacity of the host country (Omran and Bolbol, 2003). On the other hand, Elboiashi (2015) mentioned, in general, the relation of FDI is positive with the economic growth, but the magnitude of such growth depends on the conditions of the host country. Like, countries with good economic growth, attract the investors and new investments which raise up the employment level, improve income level and boost the economy, but investors may be attracted to labor intensive countries to achieve lower production cost (Tsiskanau et al., 2015), which in short run may increase the FDI inflows in country and create transitory positive impact on the economy, but in the long run, may hamper the income level and living standard of people. Strong economic and social infrastructures help to maintain improved trade environment and attract FDI in the long run (Park, 2014). The size of GDP in Bangladesh is increasing rapidly over the years. The country has been able to keep the ascending trend, in spite of volatile political conditions, corruption and weak infrastructure. From 1987 to 2015 (See Appendix), we can observe that the growth line goes up smoothly and there is no significant fluctuation in GDP.

The trade literature shows that FDI has positive impact on the economic growth of the developing countries (Hossain and Mitra, 2013). Gross domestic product (GDP) size, growth, per capita income and remittance have positive effect on FDI, whereas inflation and balance of payment deficit create negative impact (Majeed and Ahmad, 2009). Muhammad et al. (2008) found that inflation rate does not significantly affect the FDI inflows which supports Hoang (2012) that no statistically significant impact of inflation rate on FDI inflows, rather he found statistically significant negative impact of real interest rate on FDI. Such findings partially support the arguments that inflation and interest rate create negative impact on FDI inflows (Boateng et al., 2015). On the other hand, Majeed and Ahmad (2009) mentioned that impact of real lending interest rate on FDI is positive, because high lending interest rate gives MNEs the cost advantage in term of financing by home countries. On the contrary, relatively low interest rate increases the possibility of attracting more FDI in the host country (Shahrudin et al., 2010). This rate is normally differentiated according to creditworthiness of borrowers and objectives of financing which differ by country. The lending interest rate was higher in Bangladesh from 1987 to 1993, which afterward kept a descending trend and in 2005, the rate was 10.39% that is lowest in this data set. Later a significant fluctuation in interest rate is observed from 2007 to 2015 (See Appendix).

Inflation Rate generally fluctuates, with the changes in real demand and supplies for goods and services. In 1987, the rate was 9.87%, (See Appendix) which might happen due to volatile political condition of that era. In 1998, severe flood affected the inflation rate and scarcity of available supplies of goods and services pushed the inflation rate higher. From 1987 to 2015, the inflation rate was highest in 2011 with 10.70% (See Appendix) which generally assumed due to repercussions of global financial crisis and price volatility of commodities imported from international market.

PROBLEM AND PURPOSE

As FDI creates new job opportunity, enhance new technological access and improve infrastructure. Government of a country wants to increase flow of inward FDI. Government policies concerned with the
rate of corporate income tax, inflation rate, lending interest rate and the expenditure etc. play a vital role to attract such inward FDI. Previous researches extensively revealed that lower corporate income tax, inflation and interest rate increase the FDI inflows. In spite of these factors favorable, volatile political condition and inadequate infrastructure may distract the investors. The empirical evidences refer the FDI as a strong determinant of GDP. But, the impact can be showed on the other way. In this research GDP, corporate income tax, inflation rate, interest rate and government expenditure have been selected as determinants of FDI. Besides, analyzing the trend of these selected variables, a relationship of these variables has been studied and also the impact of independent determinants on FDI has been shown. For this purpose, I choose data of Bangladesh over the year 1987-2015. So, this may help to add some academic literature on this topic in Bangladesh perspective.

The purpose of this research is to analyze the trend of FDI and the trends of selected macroeconomic variables that influence FDI. The selected determinants are GDP, corporate income tax, inflation rate, interest rate and government expenditure. Later, government expenditure has been discarded because of multicollinearity. Moreover, this research will also analyze the impact of these five determinants on FDI. The hypothesis of this research is as follows.

H1: The four selected independent variables have significant impact on FDI

METHODOLOGY

Data and Sources

Data have been collected from different sources, and the time frame is from the year 1987 to 2015. Data for FDI, GDP, inflation rate and interest rate have been collected from the website of WDI. Data of corporate income tax collected from tradingeconomics.com. To avail the possibly available various updated data for FDI, the researcher physically visited Bangladesh Bank head office.

The collected data set has been compiled through MS excel. For trend analysis, time series analysis has been used and necessary graphs are prepared in MS excel. E-Views has been used for other quantitative analysis. To identify the relationship among the variables and the impact of predictor variables on dependent variable correlation and regression analysis has been used. For this purpose, the assumed regression model is:

\[ Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \mu \]

where, \( Y \) represents the dependent variable; \( X_1, X_2, X_3, X_4 \) represent the independent variables; \( \beta_0 \) is the intercept; \( \beta_1, \beta_2, \beta_3, \beta_4 \) are the regression coefficients for the independent variables and \( \mu \) states the error. So, the estimated regression equation is:

\[ FDI = \beta_0 + \beta_1 GDP + \beta_2 Inf + \beta_3 Int + \beta_4 CIT + \mu \]  \hspace{1cm} (1)

Where, \( \beta_0 \) is the intercept. \( \beta_1, \beta_2, \beta_3 \) and \( \beta_4 \) are the regression coefficients for GDP, inflation rate, interest rate and corporate income tax, while \( \mu \) represents the error for the equation. The regression analysis has been done with the help of E-Views software. Such analysis has shown the relationship between dependent and the independent variables; it also has investigated that whether the relationships between dependent and the independent variables; it also has investigated that whether the analyzed relationship are significant.

Definitions of the Variables

The following table shows the dependent and independent variables for this study with their abbreviations and definitions. The expected sign for each independent variable has been shown on the basis of literature.
TABLE 1
VARIABLES DEFINED

<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>Variables</th>
<th>Definitions</th>
<th>Expected sign</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Foreign Direct Investment (FDI)</td>
<td>Inward FDI volume of the country in a given year</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Gross Domestic Product (GDP)</th>
<th>GDP size of the country in a given year</th>
<th>+</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Inflation Rate (Inf)</td>
<td>Annual inflation rate (based on four quarters’ average) for the country</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>Interest Rate (Int)</td>
<td>Annual lending interest rate of the country</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>Corporate Income Tax (CIT)</td>
<td>Tax rate for the companies in a given year</td>
<td>–</td>
</tr>
</tbody>
</table>

GDP size reflects the productivity and profitability of a country. It helps to identify the state of economic growth of the host country. So, ascending GDP or GDP growth rate attracts the investors. Conversely, FDI accelerates country’s economic growth and GDP. Previous literatures suggest that GDP and FDI have a positive relationship. According to Guech Heang and Moolio (2013), a positive relationship exists between FDI and GDP.

Inflation rate (Inf) may increase the instability of the macroeconomic condition. Generally, it affects FDI inflows negatively. High inflation rate reduces the FDI inflows in a country (Schneider and Frey cited in Hoang, 2012). According to Kinda cited in Hoang (2012), also finds a significant negative impact of inflation on FDI inflows. Based on previous research, the expected sign for inflation rate in terms of relationship with FDI inflows should be negative (-).

Interest rate (Int) is the entry costs of business and production activities for the investors. According to Francisca and Suzanne (1996), the lower interest rate has positive impact on FDI inflows. On the contrary, Cevis and Camuradan (2007) found a positive relationship between real interest rate and FDI inflows which was conducted based on developing countries. The expected direction of the interest rate can be drawn either positive or negative. As rising in interest rate indicates increase cost of capital and financial risks; thus considering the greater macroeconomic risk of a country, the expected relationship has been shown as negative (-).

Corporate income tax (CIT) is the charges in a certain percentage based on company’s gross profit. So, if the tax rate is high, companies may become less interested to invest in a country. In general, if other indicators remain stable, higher CIT may decrease the FDI inflows a given country. On that note, it supposed to have a negative relationship between corporate income tax and FDI. OECD (2008) stated that investors always compare the tax burden of different locations and try to select a country with lower tax rate. Hence, a negative relationship between CIT and FDI prevails, and the expected sign for such relationship should be (-).

ANALYSIS AND FINDINGS

Descriptive Statistics
As a part of quantitative analysis, descriptive statistics has been done which helps in describing the basic features of the data. The following table summarizes shows the result of descriptive statistics:
### TABLE 2
SUMMARY OF DESCRIPTIVE STATISTICS

<table>
<thead>
<tr>
<th></th>
<th>GDP</th>
<th>Inf</th>
<th>Int</th>
<th>CIT</th>
<th>FDI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>71.46</td>
<td>0.06</td>
<td>0.14</td>
<td>0.36</td>
<td>0.63</td>
</tr>
<tr>
<td>Standard Error</td>
<td>8.61</td>
<td>0.00</td>
<td>0.00</td>
<td>0.01</td>
<td>0.17</td>
</tr>
<tr>
<td>Median</td>
<td>53.99</td>
<td>0.06</td>
<td>0.13</td>
<td>0.35</td>
<td>0.19</td>
</tr>
<tr>
<td>Mode</td>
<td>#N/A</td>
<td>#N/A</td>
<td>0.16</td>
<td>0.45</td>
<td>0.00</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>46.36</td>
<td>0.02</td>
<td>0.02</td>
<td>0.07</td>
<td>0.90</td>
</tr>
<tr>
<td>Sample Variance</td>
<td>2149.66</td>
<td>0.00</td>
<td>0.00</td>
<td>0.01</td>
<td>0.82</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>0.81</td>
<td>-0.45</td>
<td>-0.51</td>
<td>-1.66</td>
<td>2.53</td>
</tr>
<tr>
<td>Skewness</td>
<td>1.27</td>
<td>-0.17</td>
<td>0.08</td>
<td>0.23</td>
<td>1.75</td>
</tr>
<tr>
<td>Range</td>
<td>170.78</td>
<td>0.09</td>
<td>0.06</td>
<td>0.18</td>
<td>3.38</td>
</tr>
<tr>
<td>Minimum</td>
<td>24.30</td>
<td>0.02</td>
<td>0.10</td>
<td>0.28</td>
<td>0.00</td>
</tr>
<tr>
<td>Maximum</td>
<td>195.08</td>
<td>0.11</td>
<td>0.16</td>
<td>0.45</td>
<td>3.38</td>
</tr>
<tr>
<td>Sum</td>
<td>2072.30</td>
<td>1.84</td>
<td>3.92</td>
<td>10.33</td>
<td>18.37</td>
</tr>
<tr>
<td>Count</td>
<td>29</td>
<td>29</td>
<td>29</td>
<td>29</td>
<td>29</td>
</tr>
</tbody>
</table>

Source: Result was generated in MS excel

Descriptive statistics has been done under 95% confidence level and total observation for each variable is 29. From the summary of the above data set, we can see that GDP has a mean value of 71.46; FDI has a mean value of 0.63. The mean value for the percentage of inflation rate, interest rate and corporate income tax are 0.06, 0.14 and 0.36 respectively.

### Correlation Coefficients

A correlation coefficient is a single number that describes the degree of linear relationship between two sets of variable coefficients represent the linear dependence of two variables. It refers the direction of linear relationship between two variables. The correlation matrix for the variables is as follows:

### TABLE 3
CORRELATION MATRIX FOR VARIABLES

<table>
<thead>
<tr>
<th></th>
<th>FDI</th>
<th>GDP</th>
<th>Inf</th>
<th>Int</th>
<th>CIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDI</td>
<td>1.000000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GDP</td>
<td>0.969280</td>
<td>1.000000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inf</td>
<td>0.260564</td>
<td>0.239866</td>
<td>1.000000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Int</td>
<td>-0.384784</td>
<td>-0.470873</td>
<td>-0.050817</td>
<td>1.000000</td>
<td></td>
</tr>
<tr>
<td>CIT</td>
<td>-0.717709</td>
<td>-0.81833</td>
<td>-0.233517</td>
<td>0.787085</td>
<td>1.000000</td>
</tr>
</tbody>
</table>

Source: The result was generated in E-Views

From the above correlation matrix, we can see that FDI in Bangladesh possesses positive relationship with GDP and Inflation rate. Whereas, corporate income tax and Interest rate have negative relationship with FDI. The correlation coefficient between FDI and GDP is 0.969280, which means a strong linear relationship between these two variables. Corporate income tax has also a strong correlation coefficient with FDI, as the value is -0.717709. Inflation rate has a value of 0.260564 and interest rate has a value of -0.384784 regarding FDI.
**Regression Analysis**

To investigate the impact of the selected independent variables on FDI, regression analysis has been done. Firstly, there have been taken five (5) independent variables for the test. But after running the regression analysis, the p-value for all the variables came statistically insignificant. It could be assumed that there was a problem of multicollinearity in the data. After conducting the correlation coefficients test among only the independent variables, I took one variable with high correlation and p-value was discarded. Afterward, the model was consisting of four (4) independent variables. The regression model is as below:

\[ Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 + \beta_4 X_4 + \mu \]

where, \( Y = \text{FDI in billion US$} \)
\( \beta_0 = \text{Intercept} \)
\( \beta_1, \beta_2, \beta_3, \beta_4 \) are the regression coefficients for the independent variables \( X_1, X_2, X_3 \) and \( X_4 \).
And \( \mu = \text{error} \)

With the four selected independent variables GDP, inflation rate, interest rate and corporate income tax the regression analysis test has done with E-VIEWS software. The test has been done under 95% confidence level, so the significance level for the test was 5%. The following regression equation is found:

\[ FDI = -1.9993 + 0.0232 \text{ GDP} + 1.8717 \text{ Inf} - 5.0407 \text{ Int} + 4.3027 \text{ CIT} + \mu \]  

(2)

Following table shows the summary of the regression model. The data for the variables are annual time series data. Included observation was 29 and the regression method was Least Squares method.

**TABLE 4**

**SUMMARY OF REGRESSION MODEL**

<table>
<thead>
<tr>
<th>Dependent Variable: Foreign Direct Investment (FDI)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Independent Variables</strong></td>
<td>t-statistics</td>
</tr>
<tr>
<td>Gross Domestic Product (GDP)</td>
<td>14.7341</td>
</tr>
<tr>
<td>Inflation Rate (Inf)</td>
<td>1.1430</td>
</tr>
<tr>
<td>Interest Rate (Int)</td>
<td>-1.1378</td>
</tr>
<tr>
<td>Corporate income tax (CIT)</td>
<td>2.8775</td>
</tr>
<tr>
<td>Intercept</td>
<td>-4.6398</td>
</tr>
</tbody>
</table>

**Weighted Statistics**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>R-squared</td>
<td>0.9603</td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.9537</td>
</tr>
<tr>
<td>F-statistic</td>
<td>145.2019</td>
</tr>
<tr>
<td>Prob (F-statistic)</td>
<td>0.0000</td>
</tr>
<tr>
<td>Durbin-Watson Stat</td>
<td>1.9202</td>
</tr>
</tbody>
</table>

Source: The result was generated in E-VIEWS software.

The above table reveals that the overall probability value of F-statistics of this model is 0.00 (\(<0.05\)), which is less than 5%. So, we can say that the model is overall statistically significant. According to the
significant p-value, these independent variables can influence the dependent variable. Among the four variables, GDP and corporate income tax have significant p-value. Other p-values are more than 5%, which are not statistically significant. 50% of the total variables show significant p-value. R-squared has a value of 0.9603, which is very high indicates that 96.03% variation in FDI can be explained by these independent variables. The value of Durbin-Watson Stat is 1.9202, which is near to 2. If the value of Durbin-Watson test is 2 or near to 2, that means there is no serial correlation problem. Hence, from the Durbin-Watson value, it can be assumed that the data does not have any serial correlation problem.

**Residual Diagnostics**

Residual diagnostics has been done in E-Views software to test the model. The purpose for this analysis is to find out whether the model has any problem of serial correlation and heteroskedasticity. The null hypothesis for the Histogram-Normality test is the residuals is normally distributed. The value of Chi-square and obs. R-squared is more than 5%, so we cannot reject the null hypothesis. That means the residuals are normally distributed.

The null hypothesis for the serial correlation test is there is no serial correlation. The value of Prob. Chi-square for observes R-squared is 67.96%, which are more than 5%. So, we cannot reject the null hypothesis. That means there is no problem of serial correlation. The null hypothesis for heteroskedasticity test is there is no heteroskedasticity. The value Prob. Chi-squares for observed R-squared is 0.891, which is more than 5%. It means null hypothesis cannot be rejected and the residuals are not heteroskedastic.

**CONCLUSION**

FDI is essential for economic development of Bangladesh, which also supplies necessary finance towards the country along with improving level of income. Conversely, higher level of income per capita may attracts more investors to the country. Bangladesh has taken several initiatives to promote the investment climate via privatization and industrialization. But, sometimes relatively weak infrastructure than other competing countries and political uncertainty distract the initiatives. Bangladesh needs to be more concern about the global economy and keep pace with the global competition by improving investment environment, including both economic and social aspects. Bangladesh can be one of the desirable destinations for the investors, if it becomes more concerned to find ideal investment sectors, approaching to provide better infrastructure etc. GDP significantly impact on the FDI, and control over the inflation rate and interest rate with stable socio-economic condition may attract more investors. As government will try to minimize the rate of corporate income tax, it will be helpful to attract investments towards the country. The investment policy of Bangladesh has been transforming through privatization and trade liberalization which renders the country to be more interdependent with the global economy. Bangladesh must have preparedness to take advantage from this globalization landscape and draw focus of the foreign investors. Based on the regression analysis, this study manifests that GDP has significant positive relationship with FDI whereas, interest rate has significant negative relationship with FDI. But, the effect of inflation rate and corporate tax rate have not come as the same direction as expected. The limitation of this study is the data unavailability and in accessibility for all the data. The sample size is also relatively small. A relatively greater sample size, incorporating more variables may strengthen the model, which remains as future research scope.
REFERENCES


APPENDICES

Appendix 1

FDI NET INFLOW

![Graph showing FDI net inflow from 1987 to 2015. The graph indicates a steady increase in FDI inflows with a notable peak in the early 2000s.](image)

Source: Own Calculation Based on the Data from World Development Index (WDI)

Appendix 2

TYPE OF FDI

![Bar chart illustrating the distribution of FDI inflows by type (Equity Capital, Reinvested Earnings, Intra-Company Loans) from 1996 to 2015.](image)

Source: Own Calculation Based on the Data from Survey Study, Statistics Department, Bangladesh Bank
Appendix 3

FDI INFLOWS BY AREAS

Source: Own Calculation Based on the Data from Survey study, Statistics Department, Bangladesh Bank

Appendix 4

FDI INFLOWS BY SECTORS

Source: Own Calculation Based on the Data from Survey study, Statistics Department, Bangladesh Bank
Appendix 5

FDI INFLOWS BY COUNTRIES

Source: Own Calculation Based on the Survey study, Statistics Department, Bangladesh Bank

Appendix 6

GROSS DOMESTIC PRODUCT (GDP)

Source: Own Calculation Based on the Data from World Development Index (WDI)
Appendix 7

INFLATION RATE

![Inflation Rate Chart]

Source: Own Calculation Based on the Data from World Development Index (WDI)

Appendix 8

INTEREST RATE

![Interest Rate Chart]

Source: Own Calculation Based on the Data from Bangladesh Bank and WDI
Appendix 9

CORPORATE INCOME TAX

Source: Own Calculation Based on the Data from tradingeconomics.com