Does trade liberalization policy accelerate foreign direct investment in Bangladesh?: An empirical investigation

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ABSTRACT
Foreign Direct Investment is one of the major sources of external funding and has a significant impact on economic progress in developing countries. This paper investigates the influence of the Trade Liberalization policy on Foreign Direct Investment (FDI) inflow in Bangladesh using annual time series data 1997-2020. ARDL model is used to examine the long-run relationship, and the ADF unit root test is applied to observe the level of integration. The study also employed the Error correction model to estimate long run as well as the short-run relationship between foreign direct Investment and Trade openness, along with remaining explanatory variables used in the model. The results reveal that Trade Openness has positive effect on foreign direct Investment in the short-run, and there is no impact exists in the long-run. The study also used CUSUM and CUSUM square tests to determine stability, and plots of those tests demonstrated that the parameters of the error correction model are stable over the period.

KEYWORDS
FDI; Trade Liberalization; ARDL; ADF Test; Bangladesh

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Introduction
Foreign direct investment stimulates the economic development of a target country and originates further favorable environment for investors and companies and also prolongs the local economy. FDI inflows generate more employment opportunities with higher wages that enhances the national revenue which prolongs the economic growth of the country. Foreign direct investment permits to transfer resources and to exchange skills, information and technologies. It can minimize the inequality between revenues and expenses. Significance of FDI inflows is so much greater for developing countries when FDI illustrates investment in production conveniences. Along with assembling to capital structure and investible resources, FDI is also a way to transfer production skills, technology, innovative capability and organizational practices in global marketing networks. Progressive foreign direct investment inflows are a momentous determinant of globalization (Pekarskiene & Susniene, 2015).

Trade liberalization involves the reduction or elimination of trade barriers or trade restrictions between nations to extend free exchange of goods and services. Trade barriers include tariffs (e.g. duties & surcharges), embargoes, non-tariff barriers (e.g. licensing rules, import quotas). The primary motive of trade liberalization is to promote global foreign investment, technological competitiveness and industrial manufacture. As trade liberalization increases competitiveness from oversea, this originates a spur for cheaper manufacture and greater efficiency by domestic companies. This competition can also encourage an economy to transfer resources to such industries having competitive advantage.

Besides market size, exchange rate, government incentives, return on investment, infrastructure, political incentive – trade openness as an indicator of trade liberalization is one of the most momentous determinants of FDI. Trade liberalization policies have impact on the economic activity of a country and in attracting foreign investors. Hence, ascertaining the degree of liberalization of trade policies is important (Mayoshi et al., 2021). By liberalizing their economies and implementing different dynamic policies, several nations have attempted to attract more FDI. There may be a complicated link between trade liberalization measures and foreign direct investment. According to the majority studies conducted by (Hussain Shah & Samdani, 2015), (Shah & Khan, 2016a), (Zaman et al., 2018), (Nguyen & Do, 2020) found positive and significant impact of trade liberalization policies on FDI inflows indicating that a few restrictions on export and import in a country lead to attract greater FDI inflows. A negative relationship between trade liberalization and FDI has been found in some studies conducted by (Khan & Hye, 2014a), (Mayoshi et al., 2021). Moreover, no significant effect of trade openness on Foreign direct Investment inflows had been discovered in studies conducted by (Vijayakumar et al., 2010). The purpose of this research is to examine whether trade liberalization policy accelerated foreign direct investment (FDI) in Bangladesh from 1997 to 2020.

In the starting year 1997 of this period, the foreign direct investment inflows were US$139 million that increased to $280 million in 2000. There was mentionable decline in FDI inflows in 2001 & 2002. There was an up and down trend in FDI inflows between 2003 and 2009. After 2009, the foreign direct investment net inflows had
been improved. In 2013, the FDI inflows were US$2602 million following a slightly decrease in 2014 to $2539 million which again increased to $2831 million in 2015 which is the highest value of FDI inflows during the period from 1997 to 2020. There was a rise in FDI inflows amount of $2421 million in 2018 remaining low compared with that of 2015. The most recent value of FDI, net inflows was US$1525 million in 2020 in Bangladesh.

For the indicator Foreign direct Investment net inflows as % of GDP, data have been provided for Bangladesh for the period from 1997 to 2019. The highest value of FDI net inflows (% of GDP) in that time period was 1.74% in 2013, and the minimum value was 0.10 percent in 2002. In 2020, the value is 0.41 percent. Trade openness is taken as the indicator of trade liberalization. According to the data of TOP (Trade Openness), the highest value was 48.99 in 2012. The most recent trade openness value from 2020 is 25.48 which is the lowest value during the period from 1997 to 2020. In this study, trade openness, exchange rate, population, inflation, GDP per capita are taken as independent variables to determine whether trade liberalization policies increase foreign direct investment in Bangladesh. This paper also suggests some policy recommendations mentioning how the policy makers of the country could make effective trade liberalization policies to greatly attract foreign investors for development of the economy.

Literature review
In recent decades, the relationship between trade liberalization and FDI has received considerable attention. Researchers investigated whether trade liberalization policies encourage foreign direct investment inflows in a variety of contexts utilizing a variety of methodologies and other factors influencing FDI. For the case of Indian Industries, analyzing the impact of different kinds of trade on FDI, (Chanda, 2012) found an auspicious impact of cross-border vertical integration associated trade on FDI inflows and found no effect of horizontal intra-industry trade on foreign investment inflows. The study also stated that regions possessing larger scope of global trade are capable of attracting larger amount of FDI. Using computable general equilibrium model, Martens (2008) discovered that the trade-FDI relationship is complementary. (Liorgovas & Skandalis, 2012) disclosed that "trade openness has significantly positive effect on FDI inflows in the long run" using panel data of 36 developing countries for the period 1990-2008. In addition, exchange rate stability, GDP (market size) positively promotes FDI inflows. For this study, they used the fixed effects model.

(Kim et al., 2012) investigated the impact of preferential trade agreements (PTAs) on inward FDI of 15 relatively smaller countries signing free trade agreements (FTAs) with USA using data over the time period 1982 to 2010. They concluded that due to attaining much FDIs, smaller economies are intended to sign PTAs with large economies. (Medvedev, 2012) also tested how the PTAs affected FDI inflows in 14 East Asian and South Asian countries and found the preferential liberalization as an insignificant determinant of FDI. The same result was found in analyzing for East Asian countries only. (Khan & Hye, 2014b) examines the causal relationship between Trade liberalization Policy and FDI in Pakistan. For this study time series data were used for the time period 1971-2009. The ARDL (Autoregressive Distributed Lag) model was used for the estimation of cointegration relationship and they also used the DF-GLS test to derive the integration level. This study revealed that both the trade liberalization and the financial liberalization have negative impact on FDI inflow. Further, the variables having positive influence on inflows of FDI included infrastructural development, fixed capital formation and inflation. The study found the market size as an insignificant factor influencing FDI inflows. The reasons behind the negative association between trade liberalization and FDI in Pakistan could be lack of reliability, risk & uncertainty, imports increase and transferring maximum share of FDI to non-manufacturing sector.

(Hussain Shah & Samdani, 2015) explored the effect of trade liberalization on foreign direct Investment inflows in D-8 countries employing the data covering the period 1991-2012. They used six variables, namely, trade liberalization, market size, economic growth, financial development, exchange rate and infrastructure. This study applying the panel random effects model disclosed that FDI inflow is positively & significantly affected by trade liberalization. Mumtaz & S. Qayyum (2015) found double taxation treaties (DTTs) as an insignificant factor influencing

Figure 1. Foreign Direct Investment situation (1997-2020)
FDI inflows indicating that there is no impact of DT Ts on FDIs conducting on 15 Latin American and Carribean Developing countries.

Another study conducted by (Shah & Khan, 2016b) examined the association between trade liberalization and FDI inflows in emerging six economies. For this study they used annual data from the period 1996 to 2014. They applied panel random effects model including six variables along with trade liberalization (RTAs, PTAs) and openness. The study revealed that trade liberalization and FDI inflows are positively associated indicating that decrease in tariffs and import duties as well as govt. policies flexibility encourage foreign investors to invest in emerging six countries signing PTAs; the RTAs have negative effect on FDIs. The study also found that market size, human capital and economic development positively affected FDI inflows.

With regard to Vietnam, (Nguyen & Do, 2020) found that trade liberalization policy in relation to Free Trade Agreements (FTAs) significantly improve FDI inflows. Moreover, Vietnam - EU FTAs and CPTPP, trade agreements are beneficial to economic progress attracting more advanced FDI projects. As per literature, researchers reached at result inconsistency as the results of all studies are not unique. Looking at the aforementioned conflicting literature, further investigation is needed to examine whether trade liberalization policies accelerate foreign direct investment inflows.

**Methods**

This model examines the impact of trade openness/trade liberalization, as well as development level, infrastructure, market size, inflation, and exchange rate, on foreign direct investment in Bangladesh. For this study, we used yearly data for Bangladesh from 1997 to 2020, and data were collected from the WDI by World Bank.

The theoretical model can be formulated as following:

\[
FDI = f(GDPpc + Exrate + Elec + POP + INF + TOP)
\]

In above model, FDI stands for Foreign Direct Investment and used as a dependent variable. Independent variables are GDPpc, Exrate, Elec, INF and TOP. In considering a nation's economic dynamics, several key indicators play a pivotal role. GDP per capita (GDPpc), denoted in current US dollars, serves as a measure of the average economic output per person. Exchange rates (Exrate) are crucial in understanding the relative value of a country’s currency in the international market. The total electricity production (Elec) is a vital metric reflecting a nation’s energy capacity and consumption patterns. Inflation rate, specifically the consumer price index (INF), provides insights into the overall price stability and cost of living. Trade as a percentage of GDP (TOP) is indicative of a country’s openness to international markets and its dependence on global trade for economic growth. These indicators collectively offer a comprehensive perspective on the economic landscape, aiding analysts and policymakers in assessing a nation's economic health and formulating strategic decisions.

These variables are substituted with acceptable proxies, and the first equation is log linearized, yielding the second equation. Taking the logarithm of the variables helps eliminate predicted heteroskedasticity (Resmini, 2000).

The functional form described above can be expressed in the following econometric model:

\[
\ln fd_{it} = \alpha_0 + \beta_1 \ln GDP_{it} + \beta_2 \ln Exrate_{it} + \beta_3 \ln Elec_{it} + \beta_4 \ln POP_{it} + \beta_5 \ln INF_{it} + \beta_6 \ln TOP_{it} + \epsilon_{it}
\]

Where, \(\alpha_0\) denotes intercept term, \(\beta_1\) to \(\beta_6\) shows the slope coefficient and \(\epsilon_{it}\) expresses error term. According to Nelson and Plosser (1982) the unit root attribute is present in the majority of macroeconomic time series variables. Using Augmented Dickey - Fuller (ADF) testing approach, we will now examine the temporal variability of the mean and variance of the variables.

This study employed multiple diagnostic tests to determine the reliability of the results. Breusch-Godfrey LM test is applied to detect serial correlation among the residuals, omission of significant variable generates specification error in the model and Ramsey reset Test is utilized to detect specification error. Tests of Normality (Jerque Bera) to determine whether residuals are normally distributed. This study also utilized CUSUM and CUSUMSQR diagram to find out the stability of ECM model parameters and Breush-Godfrey test used to detect heterocedasticity.

We use the ARDL-Autoregressive Distributive Lag model method to estimate the existence of cointegration. The ARDL methodology involves estimating the following equation:

\[
\Delta \ln (FDI)_{t-j} = \beta_0 + \beta_1 \sum_{j=1}^k \Delta \ln (FDI)_{t-j} + \beta_2 \sum_{j=1}^6 \Delta \ln (GDP_{Cap})_{t-j} + \beta_3 \sum_{j=1}^6 \Delta \ln (Elec)_{t-j} + \beta_4 \sum_{j=1}^6 \Delta \ln (Excg)_{t-j} + \beta_5 \sum_{j=1}^6 \Delta \ln (INF)_{t-j} + \beta_6 \sum_{j=1}^6 \Delta \ln (POP)_{t-j} + \beta_7 \sum_{j=1}^6 \Delta \ln (TOP)_{t-j} + \phi_1 \ln (FDI)_{t-1} + \phi_2 \ln (GDP_{Cap})_{t-1} + \phi_3 \ln (Elec)_{t-1} + \phi_4 \ln (INF)_{t-1} + \phi_5 \ln (POP)_{t-1} + \phi_6 \ln (TOP)_{t-1} + \mu_t
\]

In the context of econometric analysis, the notation used represents specific components of a time series model. The symbol 'Δ' is referred to as the first difference operator. This operator is applied to a time series to transform the data into its first differences, which is a common technique used to achieve stationarity in time series data. The term 'µ' represents the drift component of the model. This component is a constant term that indicates the presence of a trend in the absence of other predictors. It captures the baseline level of the dependent variable when all other explanatory variables are equal to zero. Lastly, '\(\mu_t\)' denotes the standard white noise residuals in the model. These residuals are a series of uncorrelated random variables with a mean of zero and a constant variance. They represent the unpredictable error component of the model, capturing the portion of the dependent variable that cannot be explained by the model's explanatory variables. Together, these elements form the backbone of a time series analysis, enabling the examination and forecasting of economic and financial data. The terms with summation signs...
show the dynamics of error correction, while the second part of the equation with 1 represents the long-term relationship. This equation incorporates the time trend variable to account for autonomous time-related fluctuations.

To ascertain if a long-term correlation exists, overall F-tests are run. If F-statistic surpasses the critical value of upper limit of I(1), then rejection of null hypothesis indicates existence of long-run cointegration. Alternatively, long-run cointegration will be noticed, if the value of F-statistic fall below the lower limit I(0). (Turner, 2006) “Response surface” has been used to calculate the lower and upper limits’ critical values. When the test statistic is in the range between the lowest and maximum values, however, definitive conclusions cannot be made. The F-test determines which variable, in the case of a long-run connection, ought to be normalized.

The next stage is to estimate the error correction model after determining that the variables have a long-term relationship:

\[
\Delta \ln FDI = a_0 + \sum_{i=1}^{m} a_{1i} \Delta \ln FDI_{t-i} + \sum_{i=0}^{m} a_{2i} \Delta \ln GDP_{pc_{t-i}} + \sum_{i=0}^{m} a_{3i} \Delta \ln Elec_{t-i} + \sum_{i=0}^{m} a_{4i} \Delta \ln EXrate_{t-i} + \sum_{i=0}^{m} a_{5i} \Delta \ln INF_{t-i} \\
+ \sum_{i=0}^{m} a_{6i} \Delta \ln POP_{t-i} + \sum_{i=0}^{m} a_{7i} \Delta \ln TOP_{t-i} + \eta_1 ECT_{t-1} + \mu_{1t} \tag{4}
\]

In econometric modeling, \( \eta_1 \) represents how quickly variables return to equilibrium after a shock, known as the speed of adjustment. The term \( ECT_{(t-1)} \) stands for the lagged error correction term derived from the residuals of a cointegration model. This term captures the previous period’s deviation from long-term equilibrium, influencing the current period’s changes in the dependent variable. Essentially, these components help adjust for short-term fluctuations and maintain the long-term equilibrium in economic time series analysis. Based on a review of previous theoretical and empirical works, the following justifications are provided for the significant variables employed in this study:

**Foreign Direct Investment**

FDI has a significant impact on a country’s economic progress. Foreign Direct Investment (FDI) is described as a flow of funds from a foreign country into the host country. It is the process of gaining advanced technology, training, skills, capital, and important external properties to conduct business operations. FDI operates as a stimulant to boost economic growth and provide a more hospitable climate for investors, particularly in developing countries. It also has an impact on host country output, wages, prices, exports, imports, the balance of payments, and job creation. In summary, foreign direct investment (FDI) is a positive sign and a key factor of any country’s quick economic progress. FDI is taken as a dependent variable to explore the impact of Trade openness.

**Market Size**

Population (total) is used as a proxy for market size in Bangladesh’s World development indicators. The size of the market is an essential element in attracting FDI. Greater market sizes provide the potential for economies of scale. In FDI literature, market size is often cited as one of the most influential factors influencing FDI inflows.

**Exchange Rate**

The exchange rate may affect foreign direct investment in several ways. Some studies have shown a positive correlation between FDI and the exchange rate, while others have found a negative correlation or an inconsequential correlation. Numerous empirical research used various exchange rate metrics, including, trade-weighted index, real, nominal and volatility. (Tan et al., 2021) examines the influence of exchange rate and revealed that “there are long term stable and unidirectional causal relationship between FDI inflow and exchange rate”. “The foreign direct investment (FDI) inflow is influenced positively and significantly by the exchange rate”, as shown by (Liargovas & Skandalis, 2012); (Khandare, 2016); (Lily et al., 2014) and (Lindelwa Makoni, 2018). “Exchange rate has a detrimental effect on steering FDI into host nations”, (Asiamah et al., 2019) and (Kimino et al., 2007) discovered that the exchange rate had no substantial effect on FDI inflow.

**Infrastructure**

The availability of superior, developed, and high-quality infrastructure is one of the most important aspects in luring investors to invest in a nation (Shah, 2014). The power output (total) proxy from World development indicators 2014 is included, and a favorable impact on foreign direct investment is anticipated.

**Trade liberalization**

Trade liberalization/openness is the primary variable in this research. Openness in this context refers to when a country allows or permits another nation to access its market through investment, imports, exports, etc. There are more investment prospects in economies that are more liberal than in those that are more restrictive. As shown by our literature study, various writers, including (Liargovas & Skandalis, 2012), emphasize the significance of attracting foreign investment to host nations.
**Inflation**

Numerous macroeconomic variables have been recognized as key FDI attracting factors in the empirical research. However, the function of inflation has been one of the most contentious and passionately discussed. Several academic studies have investigated the influence of inflation in luring FDI. According to these findings, inflation has a significant effect on FDI. However, their conclusions about the effect of inflation on FDI flows to recipient nations have been inconsistent. Several research, including those by (Mugableh, 2015; Agudze & Ibhagui, 2021), (Asiamah et al., 2019), and (Mutum, 2015), have shown a negative correlation between inflation and FDI inflows. Recent research, such as those conducted by (Kaseeram et al., 2011), provides evidence to indicate a favorable influence of inflation on FDI inflow. Others, however, found no correlation between inflation and FDI; (Gunawardhana & Damayanthi, 2020), (Hintošová et al., 2018); (Amoah et al., 2015).

**Results**

A unit root test was conducted based on (Elliott et al., 1996). To check the stationary in the time series data, this empirical investigation utilized (ADF) unit root test. The outcome of this test is given in following table. This test’s null hypothesis assumes that each variable has a unit root. We reject the null hypothesis if the absolute value of the ADF test statistics exceeds the critical value at a significance level of 5%, or if the p value is less than 0.05.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Without Trend</th>
<th>With Trend</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Level</td>
<td>1st Difference</td>
</tr>
<tr>
<td>LNFDI</td>
<td>-1.471223</td>
<td>-4.789173***</td>
</tr>
<tr>
<td>LNGDPpc</td>
<td>2.255311</td>
<td>-3.023112**</td>
</tr>
<tr>
<td>LNXrate</td>
<td>-2.717228***</td>
<td>-3.687181**</td>
</tr>
<tr>
<td>LNElec</td>
<td>0.504322</td>
<td>-4.748646*</td>
</tr>
<tr>
<td>LNPOP</td>
<td>0.230352</td>
<td>-2.446583</td>
</tr>
<tr>
<td>LNINF</td>
<td>-2.905551***</td>
<td>-4.910178*</td>
</tr>
<tr>
<td>LNTOP</td>
<td>-1.39257</td>
<td>-3.488597**</td>
</tr>
</tbody>
</table>

Where, *, **, *** denoted for 1%, 5% and 10% significance level respectively.

The results reveal that, in the absence of a trend, the ADF statistics for all variables are less than the critical value, and the p values at the 5 percent significance level are more than 0.05. Therefore, we cannot reject the null hypothesis at the 5 percent level, and all variables have a unit root. Again, at the first difference, with the exception of lnPOP, the probability values of all variables are less than 0.05, indicating that the null hypothesis is rejected. Before first difference, all variables have a unit root at levels, but with the exception of lnPOP, all variables become stationary. Consequently, they are integrated into order 1 (1). With both intercept and trend present. Except lnPOP, all variables are nonstationary at levels under 5 percent significance level. lnPOP becomes nonstationary at the first difference, whereas the remaining variables become stationary. Other variables are consequently integrated to order 1, I(1), while lnPOP is integrated to order 0, I(0).

We have utilized three residual diagnostic tests for the adequacy of the model such as heteroscedasticity, Normality assumption, and serial correlation.

**Table 2. Diagnostic Test for Model Adequacy**

<table>
<thead>
<tr>
<th>Items</th>
<th>Test applied</th>
<th>Probability Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normality</td>
<td>Jarque-Bera</td>
<td>0.093456</td>
</tr>
<tr>
<td>Serial Correlation</td>
<td>Correlation LM Test</td>
<td>0.9791</td>
</tr>
<tr>
<td>Functional Form</td>
<td>Ramsey’s reset test</td>
<td>0.1197</td>
</tr>
<tr>
<td>Heteroscedasticity</td>
<td>Breusch-Pagan-Godfrey</td>
<td>0.1197</td>
</tr>
</tbody>
</table>

Source: Calculating using Eviews 12 student version

From table (2), the probability value of the F-statistic in the Breusch-Godfrey LM test is 0.9791. This probability value is greater than 0.05 at a significance level of 5%, indicating that we cannot reject the null hypothesis of no association among the residuals. In the Jarque Bera test, the probability value is 0.0934 and which is also higher than 0.05 and shows that there is no evidence to reject the null hypotheses and disclose that residuals of the model are normally distributed. The existence of specification error may create inappropriate results, and sometimes, this error arises from the omission of a significant variable. To detect specification error, this model has employed Ramsey Reset Test, and the result of this test showed that the p-value is 0.1197. Since this value is higher than 0.05, there is no specification error, and the model is correctly specified. The result of the Breusch-Pagan-Godfrey test for heteroscedasticity also brings out that there is no existence of heteroscedasticity.

There is no serial correlation or heteroscedasticity in the model. In addition, the functional form is valid and stochastic residuals have a normal distribution. The calculated model passes every necessary diagnostic test. According to the bounds testing approach, the cointegration test compares F statistics to critical values. Given that the number of lags placed on the differenced variables at each iteration affects the F-value statistic’s (Bahmani-Oskooee & Nasir, 2004).
Table 3. F-Bound Test for Testing the Presence of Long-Run Relationship

<table>
<thead>
<tr>
<th>K</th>
<th>F-Statistics</th>
<th>Significance level</th>
<th>Lower Bound, I(0)</th>
<th>Upper Bound, I(1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>7.250656</td>
<td>10%</td>
<td>2.12</td>
<td>3.23</td>
</tr>
<tr>
<td>5</td>
<td>2.45</td>
<td>5%</td>
<td>2.12</td>
<td>3.61</td>
</tr>
<tr>
<td>2.50</td>
<td>2.75</td>
<td>2.50%</td>
<td>2.12</td>
<td>3.99</td>
</tr>
<tr>
<td>1</td>
<td>3.15</td>
<td>1%</td>
<td>2.12</td>
<td>4.43</td>
</tr>
</tbody>
</table>

Source: Calculating using Eviews 12 student version

At the 5% level of significance, the calculated F statistic of 7.250656 exceeds the critical value's upper limit of 3.61. Therefore, we draw the conclusion that the null hypothesis cannot be accepted at the 5% level of significance and there is existence of cointegration.

The ARDL cointegration procedure was applied to find out the log-run relationship among the coefficients of equation (3). The long-run result are reported in table (4). According to this result, LNINF is significant at 1% significance level and others variable are insignificant. So, all variables have no long run relationship with dependent variable LNFDI with the exception of LNINF.

Table 4. Long-Run coefficients of ARDL

<table>
<thead>
<tr>
<th>Variables Name</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>T Statistic</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>LNGDPPC</td>
<td>-0.932878</td>
<td>1.00826</td>
<td>-0.925235</td>
<td>0.3731</td>
</tr>
<tr>
<td>LNEXRATE</td>
<td>-3.403903</td>
<td>3.778135</td>
<td>-0.900948</td>
<td>0.3853</td>
</tr>
<tr>
<td>LNELEC</td>
<td>1.464837</td>
<td>1.091381</td>
<td>1.342187</td>
<td>0.2044</td>
</tr>
<tr>
<td>LNPOP</td>
<td>12.77019</td>
<td>10.43803</td>
<td>1.223429</td>
<td>0.2446</td>
</tr>
<tr>
<td>LNINF</td>
<td>0.889747</td>
<td>0.259298</td>
<td>3.43137</td>
<td>0.005*</td>
</tr>
<tr>
<td>LNTOP</td>
<td>0.614984</td>
<td>0.732799</td>
<td>0.839227</td>
<td>0.4177</td>
</tr>
</tbody>
</table>

where, *, **, *** denoted for 1%, 5% and 10% significance level respectively.
Source: Calculating using Eviews 12 student version

To find out the short run relationship, this study utilized Error Correction Regression. The results of the short-run dynamics are reported in table (4). According to this result, LNGDPPC and LNTOP are significant and indicating rejection of null hypothesis. So, LNGDPPC and LNTOP have short run cointegration with dependent variable LNFDI.

Table 5. Short-Run Estimation Result

<table>
<thead>
<tr>
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Source: Calculating using Eviews 12 student version

The coefficients of LNGDPPC is 1.94003 and the sign of this coefficients is positive. That means 1% increase in GDP per capita will lead to increase in FDI by 194% in shortrun. The coefficients of LNTOP indicates that, in short-run 1% increase in trade will lead to raise the FDI by 161.18%.
To check the stability of Error Correction model coefficients, this study utilized CUSUM and CUSUMSQ plots. From the plots of CUSUM and CUSUMQ, residuals plots are lies within the critical bound. which implies that all coefficients in the model are stable.

**Discussion**

The results present a comprehensive analysis of the economic variables under study. The unit root test initially indicated non-stationarity at levels for most variables, but their transformation to first differences helped achieve stationarity, a common occurrence in time series data. The model's robustness was further established through diagnostic tests, ensuring that the results were not marred by common issues like serial correlation or heteroscedasticity. The finding of cointegration suggests a long-term equilibrium relationship between the variables, particularly between LNINF and LNFDI. This implies that inflation rate changes could significantly influence foreign direct investment in the long run. In contrast, the short-run dynamics highlighted by the Error Correction Model emphasize the immediate impact of changes in GDP per capita and trade on FDI. These findings are crucial for policymakers, as they highlight different factors influencing FDI in the short and long term. The stability of the model, as confirmed by the CUSUM and CUSUMSQ tests, adds to the reliability of these findings, suggesting that the relationships identified are consistent over time. This aspect is particularly important for making long-term economic predictions and policies. Overall, the analysis provides valuable insights into the factors influencing foreign direct investment, crucial for strategic economic planning.

**Conclusion**

This study's primary purpose was to determine the effect of the Trade Liberalization Policy on FDI. In this research, we investigated the relationship between trade liberalization policies and foreign direct investment. This empirical study revealed that Inflation is the only significant independent variable, and LNEXRate, LNElec, LNGDP, LNTOP, and LNPOP are statistically insignificant variables. That means, with the exception of Inflation, others variable have no significant impact on Foreign Direct Investment in the Long-run in Bangladesh. In absence of long-run cointegration between Trade openness and foreign direct investment, Trade liberalization policy does not accelerate FDI in the long-run. But it is positively related to the Foreign Direct Investment in the short run. So, through the Trade liberalization Policy, Bangladesh has the opportunity to gain benefits from FDI in the long run. To achieve the highest advantages of FDI via Trade liberalization policies, the stability and reliability of these policies must be strengthened. This may be done by eradicating corruption, breaking up large loanee monopolies in the private financial sector, and attaining political stability. The investment environment must be enhanced, particularly in light of the energy crisis and the growth of infrastructure. By fostering a favorable investment environment, host nations may not only attract investment, but also steer it to the manufacturing and production sectors.

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**References**


**Figure 2. CUSUM and CUSUMSQ test**


