RELATIONSHIP BETWEEN OUTWARD FDI AND HOME COUNTRY EXPORTS: AN EMPIRICAL STUDY OF BANGLADESH

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ABSTRACT

The present paper inspects the association between outward foreign direct investment (OFDI), exports, and growth exhausting data from 1990-2021. The novel estimation procedure of ARDL is used in the study to examine the long and short-run dynamics. Further, the causal relationship between outward FDI, exports, and growth is also examined. The results imply that Bangladesh's exports, OFDI, and economic growth have a long-term cointegrating relationship. Additionally, FDI from abroad helps to increase the nation's exports. The study's conclusions are supported by the negative coefficient of the ECT. The study provides useful insights for the policymakers of the country.

Keywords: *Bangladesh, Exports, OFDI, GDP, ARDL*
JEL : C5; F2; O1.

Introduction

Developing countries generally depend on the inflows of foreign capital from developed countries due to several reasons such as lack of resources and deficit in the balance of trade. According to Neo-classical and Endogenous growth theories, FDI supports economic growth in various ways such as by facilitating the adoption of new knowledge in instructive activities through skill development and enhanced administrative skills (Lee & Chang, 2009; Ibrahim & Alagidede, 2020; Singh, 2022). FDI has several positive implications on long-term economic growth, thus developing countries have been actively attempting to draw in foreign capital (e.g., Dasgupta et al., 2014; Sethi et al., 2020; Blomstrom et al., 1994; Borensztein et al., 1998; de Mello, 1997).

According to Modified theories for Third World Firms (Sharan, 2005), firms from developing countries have long been acquiring technology from the developed world, but this technology is primarily made to serve a large market, thus, companies export their output after satisfying the local demand. The products eventually reach maturity and business then establishes units in the nations that import their products. However, it differs from the prod-

uct life cycle idea, suggesting that businesses adjust their products to meet the needs of the consumers in the various region, rather than necessarily innovating the product.

Thus, at this stage, trade is replaced by OFDI as businesses relocate production components to other nations to remain cost-competitive When the domestic market becomes more competitive than the international market in the final stage, businesses begin to produce items in their home countries using intermediate goods and expertise acquired through OFDI. Likewise, commerce and investment work best together in this situation. Depending on the investment goal and, consequently, the specific investment type, there are various ways that OFDI can impact domestic output through production interdependencies (Herzer, 2010). The degree of internationalization particularly in the case of businesses affects the association between OFDI and exports.

Additionally, the link between exports and FDI has also piqued researchers' attention. Historically, industrialized nations have been the primary source of OFDI, owing to their bigger technological capabilities and financial ability to produce in huge international markets. Emerging economies, on the other hand, have been a key source of FDI in the previous two decades, with a surge in both absolute and relative OFDI. There has been much discussion on the effects of foreign involvement of overseas people in the form of OFDI and rising exports in the home country as a result of rising globalization and increasing internationalization. How developing country OFDI affects global competitiveness is the most divisive topic in recent literature on the topic of home nation exports (Ahmad et al., 2016).

Bangladesh, which was a part of the Indian sub-continent, became an independent country in 1971 by taking the help of the Indian army. After the independence, many macroeconomic changes were placed in Bangladesh. Immediately after its independence, more than 70% of its population was below the poverty line and Inflation was at its peak. Initially, Bangladesh adopted the socialist system of the economy, but it was not much fruitful, thus adopted the mixed system of the economy and privatized many industries such as telecom industries, banking, etc. After this many other problems such as army coups and political instability adversely affected the economy of Bangladesh. After all these struggles, in the 1990s, Bangladesh's economy started growing. The governing body of Bangladesh focused on increasing exports of readymade garments, developing the shipping industry, women empowerment and education, etc. The economic and social development of the economy in the post-1980s was termed a miracle in the history of Bangladesh. The country achieved remarkable progress after all its struggles such as political instability, extreme poverty, economic and social inequalities, and inflation, etc.

The year 2008 marked a turning point for the economy of Bangladesh. On January 6, 2009, Sheikh Hasina became the prime minister of Bangladesh. Bangladesh experienced a miracle on this day. Sheikh Hasina placed a strong emphasis on the economic empowerment of women, their education, the apparel and shipping sectors, and export revenues. Sheikh Hasina's initiatives for women's emancipation and education have resulted in a 37 percent female labor force involvement rate in Bangladesh. The rate of poverty has significantly decreased in Bangladesh. This poverty reduction is the result of policies put in place by Bangladesh's diligent government, which used a variety of strategies to do so, including promoting women's empowerment and education, the production of ready-to-wear for export, the shipping sector, the growth of various industries, and the development of the service sector (Mujeri & Mujeri, 2020). Bangladesh's economy, which is built on markets, is the 2nd-largest in South Asia and the 41st-largest in the world (World Bank, 2020). In the last some decades,

a noticeable growth has been observed in Bangladesh. That's why it has become a center of attraction for many researchers in the present time.

Export profits, remittances, and FDI are three of a least developed country's main revenue streams. The three basic elements of FDI are equity capital, reinvested earnings, and intra-company loans. Equity capital, as the name suggests, refers to ownership and the acquisition of shares of a company by a foreign investor who resides in a nation other than his own. Reinvested earnings are the investor's portion of profits that are not returned to him as dividends but are instead retained by the company or any subsidiary. Contrarily, intra-company loans are debt transactions in which the foreign parent company lends money to its subsidiaries on a short and long-term basis. Recently, Bangladesh has seen a sharp increase in FDI inflows, which has helped to spur some development. Bangladesh is one of the LDCs with a certain advantage in luring FDI. Although the nationalization program of the government immediately after independence hurt our FDI attraction in the years before the 1980s. There was a misunderstanding that permitting FDI meant maintaining foreign interest. The Foreign Private Investment Act was implemented by Bangladesh in 1980 to promote FDI to address the lack of domestic financial capacity. This Act guaranteed a complete return of capital and profits while also protecting foreign investors against expropriation. Additionally, it guaranteed fair treatment for both domestic and international investors and granted foreign sectors a 5-7 year corporation tax break.

The goal of FDI liberalization was to boost employment, promote economic growth, and open up new sources of much-needed capital. Particularly in Bangladesh, FDI plays a significant role in the acceleration of GDP. Islam (2014), Ahamed & Tanin (2010), and Faruk (2013) found the positive influence of FDI on Bangladeshian economic development. Similarly, Reza et al. (2019); Ahmed (2009) and Islam (2019) found that exports play an important role in the economic growth of Bangladesh. Whereas, Ahmed (2009) found the negative influence of exports on the economic growth of Bangladesh. Similarly, Rahman (2015) found an adverse association between the FDI and the economic development of Bangladesh. Islam & Sahaja-lal (2019) are indifferent to the relationship between FDI and the economic development of Bangladesh. From reviewing existing literature, one cannot conclude the association between FDI, exports and the economic growth of Bangladesh. That's why we want to re-examine the association between these variables.

Empirically, FDI inflows lead to the emergence of export-oriented industries that boosted domestic economic growth, infrastructure development, and job-creating activities. But other important factors, like GDP per capita, average GDP growth rate, foreign reserve, gross capital formation, human capital, terms of trade, and other essential infrastructure, affect FDI inflow.

Table 1: FDI, and exports in Bangladesh

Year	1991	2001	2011	2021
Exports of goods and services (BoP, current US Billion $)	2.12	6.84	26.99	49.39
Foreign direct investment, net outflows (BoP, current US Million $)	0.4	20.6	297.43	4.82

Source: World Bank (2022)

As shown in Table 1, exports are increasing at a higher rate with time. It has increased more than 24% in the year 2021 from the year 1991. FDI also shows an increasing trend. Only

$11.60 million worth of FDI left the nation's net in 2020 with leaving Bangladesh increasing significantly in 2021 reaching the net amount of external FDI to US$91.71 million in 2021, representing a gain of over 209% over the amount in 2020. Further, the government of Bangladesh launched several attempts to entice FDI into the nation, including an international roadshow, a special tax holiday, 100% repatriation of dividends and invested capital, resident status, citizenship, and many more enticing deals. But the response is lacking in quality. With the South Asian region's most lenient investment policy and incentive system, Bangladesh has been supporting FDI for decades.

Equal treatment for both domestic and foreign investors is guaranteed by the Foreign Private Investment (Promotion and Protection) Act of 1980. Additionally, this law safeguards foreign investments in Bangladesh from expropriation and nationalization. Additionally, it provides a guarantee for dividend and capital repatriation. Over the past ten years, Bangladesh's GDP has consistently increased by over 5% without ever seeing a decline. Even amid the recent global economic crisis, Bangladesh maintained growth of over 5%. Bangladesh's GDP increased by 5.9% in 2009. Its expenditure. A welcoming environment offers significant and alluring packages of incentives, such as 100% ownership, tax and tariff exemptions, and others, to foreign investors. In terms of the incentive package, Bangladesh has a higher ranking than many underdeveloped nations. FDI has been permitted in all economic sectors, except five: railroads, nuclear energy, forestry, defense equipment, and security printing.

Against these backdrops, this study is an attempt to better understand the role of FDI in Bangladesh. This study makes the following contribution to the existing study. First, it cannot be ignored that FDI was Bangladesh's main driver of economic growth. It led to the creation of an investor-friendly policy to draw more foreign capital into the nation. Also, exports generate a heavy share of the income of Bangladesh. Therefore, the present study is an attempt to analyze the influence of OFDI and exports on the economic growth of Bangladesh. Secondly, The amount of FDI leaving Bangladesh increased significantly in 2021 reaching the net amount of external FDI to US$91.71 million in 2021, representing a gain of over 209% over the amount in 2020. Additionally, it revealed that, compared to $31.06 million in 2020, the gross amount of outward FDI stood at $94.69 million last year. Therefore, the present study incorporates the influence of OFDI which is showing an increasing trend in Bangladesh. Thirdly, the present study used ARDL methodology which provides unbiased results in case of endogeneity and multicollinearity. Therefore, the results of the study are valid and consistent. Fourth, the present study provides useful policy implications and it provides useful information to foreign investors.

We establish the balance of the paper as follows. In Section 2, we provide an overview of the selected studies on exports and outward FDI. In Section 3, we go over the data and the econometric methods. In Section 4, we provide the findings and discussions. Section 5 concludes the analysis with policy commendations.

Review of Literature

Several authors have observed the connection between exports and FDI, yet the findings are inconclusive. Some authors have provided evidence of the FDI-led growth hypothesis while others consider exports and FDI to be a detrimental factor adversely affecting the economic progress of the recipient country. Dasgupta et al. (2014), for the period 1992-2013, by using the panel causality test and panel unit root test, found the significant and positive influence of OFDI on national investment in the long as well as the short run.

Zardoub (2021) analyzed the influence of capital flows on development in developing countries. The study used ADF &PP test for unit root and ARDL model for short and long-run relationships. The results reveal that a long-term connection between the variables already exists.

Izadi et al. (2021) employed the GMM model for the period 2001-2017, to test the association between inward FDI and its financial and non-financial channels and reported a positive association of market capitalization, exchange rate and inflows of FDI, a negative association of financial openness, inflation and FDI inflows.

Khan et al. (2020) examined the effect of overseas inflows on the growth of 24 countries of the OBOR belt for the period 1995-2016. The observed results discovered that foreign inflows have an insignificant impression on economic growth whereas quantile regression quantified the positive and considerable effect of overseas flows on the growth at the 80th quantile.

Tahir et al. (2020) inspected the importance of outward inflows in Pakistan in the economic growth from 1976 to 2018 by analyzing the ARDL model for the long-run connection while the equilibrium correction model, captures the short-run changing aspects. The results reveal the positive impact of transmittals, assistance, debt and foreign inflows on economic growth.

Sethi et al. (2020), for Pakistan, India and Sri Lanka, tested the link among FDI, financial growth and economic growth for the span 1990-2018 by using the panel cointegration test, granger causality test and test for examining the short and long-run dynamics. The outcomes revealed that a short-run causality has been found running from per capita GDP to FDI and financial growth.

Infrastructure's effects on exports and the flow of FDI in a few Southeast Asian economies from 1990 to 2018 were examined by Rehman et al. in 2020. Panel cointegration and pooled mean were employed by the authors to examine the data. The findings show that infrastructure overall and in its parts considerably increases export and FDI inflows over time. Additionally, over time, there is a positive cointegration between infrastructure, export, and FDI inflows.

Hayat & Tahir (2021), using panel data from 1996-2016, using the non-linear threshold model, tested the influence of natural resources on growth in FDI. They reported that The results show that if the export of natural resources from the host country is below the statistically significant projected threshold, FDI has a considerable beneficial impact on the host country's economic growth.

Silajdzic & Mehic (2022), for the period 1998-2007, by employing the Prais-Winsten regression model studied the impact of FDI on the economic growth of Southeast Europe. The study concluded that a positive influence of FDI on economic development has been found in Southeast European growth.

Bhasin & Kapoor (2020) looked at how FDI from abroad affected exports from the BRICS countries between 1993 and 2015. Panel Unit Root and Panel Co-integration tests were employed in the investigation. The findings show that Exports from the home country are negatively and significantly impacted by OFDI, showing that in these nations, outbound FDI serves as a substitute for exports. It also suggests that exports have a long-term causal relationship with OFDI. The association between OFDI and exports is not a long-term one.

Abbes et al. (2015), for the period 1980-2010, by employing the dynamic panel co-integration, found the unidirectional causality from FDI to GDP in 65 countries. Bajo-Rubio & Montero-Muñoz (2001) explored the causal association between FDI and trade for the period 1977-1998, by employing various econometric techniques such as Granger Causality tests, unit root tests, etc. The study concluded that a unilateral causal running has been found from FDI to exports in the short run and the long run, and a bilateral causality has been found between both selected variables.

Although several authors initiated a negative relationship between FDI and Exports. For example, Ahmad et al. (2016) planned the association between outward FDI and exports in the ASEAN region for the period 1981-2013, by applying the OLS regression and found a complementary association between exports and outward FDI, an adverse and replacement effect of OFDI and exports. Basu et al. (2003), for the period 1978-1996, by employing the unit root testing, and granger causality test in 23 developing nations, tested the association between liberalization, FDI and economic growth and found that in more open countries, a bidirectional causality has been found between FDI and GDP, in less open nations unidirectional long-run causality has been found from GDP to FDI. Bhasin & Paul (2016), over the period 1991-2012, using the panel VAR method, explored the association between exports and outward FDI. The study concluded that the long-run causality runs from OFDI to exports. Then, Ilmi (2017) found that interaction between FDI and innovation of exporter countries have a positive and significant impact.

Dash & Sharma (2011) tested the association between FDI, trade & economic development in India during 1991-2006 by using the VAR method, the Toda-Yamamoto approach. The outcomes of the study revealed that a two-directional causality has been found between FDI and growth. A one-directional causality has been found between exports and FDI. Dritsakis & Stamatiou (2017) studied the influence of FDI, exports, and unemployment on the economic growth of EU members for the period 1995-2013 by using the ECM model, a causality testing approach. The study concluded that Exports and economic growth have long-term causal relationships in both directions, but economic growth and unemployment have long-term causal relationships in just one direction. Siddique et al. (2017) tested the influence of FDI on economic growth from the time span1980-2016 by employing the ARDL and VAR models. The study's findings showed that there is one-way causality between the labor force and physical and human resources. Corporal capital and FDI as well as physical as well as human capital have been demonstrated to have a bidirectional causal relationship. Using multiple regression analysis, From 1999 to 2013, Rahman (2015) found a link between FDI and economic growth in Bangladesh that was negative.

Data and Research Methods

The research relies on secondary data. The study used many variables to understand the possible impact of outward FDI on exports in Bangladesh. Two additional variables Trade openness and Exchange rate have been used as control variables. The study tests the cointegration association between OFDI and Exports in India using the ARDL model established by Pesaran et al. (2001). This methodology consists of performing four steps, the first being the examination of the stationarity of the time series; the ARDL model permits the usage of mixed-order integrated series but not the second-order stationary series. Therefore, our study used the Augmented Dickey-Fuller (ADF) and PP unit root tests to test the stationarity of the series. The second step consists of the analysis of cointegrating between the variables using F-statistics. The third step involves the estimation of long-run linkage between the variables

while the last stage is to test the short-run dynamics along with the speed of equilibrium. This method is chosen because it can handle the variables in the model when the variables are unified in a different order. If the sample size is small, this model gives more robust and reliable results. The data set used in the study covers the period 1990-2021 sourced from the WDI (World Development Indicator).

Table 2: Description of variables

Symbols	Description	Source
GDP	GDP (current US$)	WDI
EXP	Exports of goods and services (% of GDP)	WDI
OFDI	Foreign direct investment, net outflows (BoP, current US$)	WDI

Source: World Bank (2022)

FDI is taken as net outflows, Exports of goods and services and Real GDP (current US$) is taken as a representation of economic growth. The GDP is considered to be the foremost pointer to assessing the health and size of a country. Examining the integrating effects in a series is a pre-condition since most time-series data are found to be non-stationary. Regression of non-stationary variables might bring bogus results which in turn lead to unbecoming interpretations. The ADF unit root test is employed to spot the order of the combination of the variables. The optimum lag length based on Schwarz Bayesian Information Criterion is selected. To examine the cointegration between the variables, the Engle-Granger cointegration (1987) and Johansen-Juselius cointegration (1990) tests are widely adopted. The foremost condition to implement these approaches is that all the variable quantities involved are stationary at the first difference, i.e. I (1). Further, these methods generally give better estimates for the long run only. The ARDL procedure for co-integration generally overcomes these drawbacks. Further, this approach has various econometric merits, which makes it gaining more popularity in recent years. It takes into account the variables in dissimilar order of integration i.e.; some variables are integrated with either I (1) or some of them are in I (0).

$$GDP_t = OFDI_t + EXP_t + c \tag{1}$$

Where GDP is the representation of gross domestic product. OFDI is the presentation of outward FDI. Exports are represented by EXP.

After finding that the variables have mixed order stationarity properties, we proceed with the estimation of the following ARDL equation:

$$\Delta(EXP_t) = \beta_0 + \beta_1(GDP_{t-1}) + \beta_2(OFDI_{t-1}) + \beta_3(EXP_{t-1}) + \beta_4(EXCH_{t-1})$$
$$+ \beta_5(TO_{t-1}) + \sum_{i=1}^{p} \theta_{1i}\Delta(GDP_{t-1}) + \sum_{i=0}^{p} \theta_{2i}\Delta(OFDI_{t-1}) \tag{2}$$
$$+ \sum_{i=0}^{p} \theta_{3i}\Delta(EXP_{t-1}) + \sum_{i=1}^{p} \theta_{1i}\Delta(EXCH_{t-1}) + \sum_{i=1}^{p} \theta_{2i}\Delta(TO_{t-1}) + \varepsilon_t$$

where 0 is the intercept and 1, 2, 3, 4, and 5 are long-run coefficients represented by lagged GDP, FDI, and EXP values. For the short-run values, the operator is utilized, and p is the maximum lag order. While is the identical and randomly distributed error term. The null and the alternative hypothesis under the model are as follows:

$H_0: \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = 0$ (no long-run relationship)

$H_a: \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq 0$ (long-run relationship exists)

If the joint significance F-statistic surpasses the critical value determined as per Narayan (2004), the null gets rejected and vice versa. However, if the F-statistics value is in between upper and lower bounds, the conclusion is indecisive. After confirming the long-run relationship among the variables, long and short-run estimations are made. Further, the following Error correction model is estimated:

$$\Delta EXP_{it} = \beta_0 + \sum_{J=1}^{p} \delta_1 \Delta GDPG_{t-j} + \sum_{J=0}^{q} \theta_2 \Delta FDI_{t-j} + \sum_{J=0}^{a} \vartheta_3 \Delta EXP_{t-j}$$
$$+ \sum_{J=1}^{p} \delta_1 \Delta EXCH_{t-j} + \sum_{J=0}^{q} \theta_2 \Delta TO_{t-j} + \rho_{1j} ECT_{l-1} + \varepsilon_{it}$$

(3)

where ECT is the error rectification term. It is the speed of tuning of parameters and illustrates how much of the disequilibrium is being corrected. The positive value of the coefficient of error correction term is an indication of divergence while a negative value indicates convergence.

Findings and Discussion

The summary of expressive statistics for data has been shown in Table 3, in terms of mean, median, standard deviation, kurtosis, probability, etc. The average GDP for Bangladesh is US\$125.4 billion. The maximum GDP has US\$416.2 billion in 2021. The skewness value for each series is small but positive for all variables (Except Exchange rate), indicating that the distribution's upper tail is thicker. The results of Jarque-Bera indicate that data is normally distributed because the *p*-value of Jarque-Bera statistics is more than the significance level. The value of kurtosis is less than 3 in all the series except aid which indicates that the distribution is platykurtic. The distribution of series aid is platykurtic as its kurtosis value is more than 3.

Table 3: Descriptive Statistic

	EXP(B)	GDP(B)	OFDI(M)	TO	EXCH
Mean	18.118	125.451	65.179	0.338	62.227
Minimum	2.064	30.957	0.060	0.190	34.569
Maximum	49.386	416.265	546.877	0.504	85.084
Std. Dev.	15.196	113.438	120.654	0.088	16.912
Skewness	0.647	1.310	2.517	0.294	-0.194
Kurtosis	1.946	3.410	9.430	2.204	1.608
Jarque-Bera	3.717	9.374	88.920	1.305	2.786
Probability	0.156	0.009	0.000	0.521	0.248
Observations	32	32	32	32	32

Source: The Author

Table 4: Correlation Matrix

	EXP	GDP	OFDI	TO	EXCH
EXP	1				
GDP	0.94759	1			
OFDI	0.315625	0.093486	1		
TO	0.43391	0.165065	0.705103	1	
EXCH	0.915091	0.811826	0.424307	0.659322	1

Source: The Author

The correlation between the two macroeconomic variables, i.e., EXP and GDP are strong (0.94). This suggests that the two variables are highly correlated with each other, implying that an increase in EXP leads to the increased economic growth in India. (Table 4). A univariate study is conducted to identify the stationary of the data. The results of the ADF and PP test at the level and first difference of the variables are shown in Table 4. It is evident that out of the two variables considered in the model, FDI is stationary at a level while the other variable is non-stationary at a level.

Table 5: Unit Root Tests

	PP				
	Level		**Differencing**		
Variables	**Constant**	**Trend and Consent**	**Constant**	**Trend and Consent**	**Decision**
EXP	1.2284	-1.2487	-6.6034***	-7.4893***	1(1)
OFDI	-3.0256**	-3.2344*	-14.118***	-15.102***	1(0)
GDP	6.2287	1.7329	-1.9851	-4.1774**	1(1)
TO	-1.8544	-1.246	-5.1491***	-5.4751***	1(1)
EXCH	-1.9063	-1.6723	-5.4056***	-6.653***	1(1)
	ADF				
EXP	1.7148	-1.5185	-1.816	-7.3222***	1(1)
OFDI	-2.9956**	-3.1733	-7.9843***	-5.1351***	1(0)
GDP	3.6542	1.7329	2.5	-4.1667**	1(1)
TO	-1.8527	-1.2628	-5.1486***	-5.4784***	1(1)
EXCH	-0.9994	-1.7489	-4.8175***	-4.1189***	1(1)

Source: The Author
Notes: ***, **, & *Indicates significance at the 1%, 5% & 10% levels respectively.

If a time series is non-stationary, it can create spurious regression which can lead to unreliable results. To escape from these types of problems, it becomes necessary to test the stationarity property of the time series. To examine the stationarity property of the time series, a unit root test has been used. This study has applied ADF and PP tests at the level and 1st difference to determine whether the time series data set is stationary or not. Johansen's multivariate test cannot be applicable as the variables are cointegrated in mixed order. The results of the ADF and PP test reveal that all the variables are integrated at first difference except OFDI. This mixed order of variables allows us to apply the ARDL cointegrating approach.

Table 6 illustrates the empirical results of the ARDL approach to cointegration. To examine the long and short-run relationship in this model, the appropriate lag is estimated based on Schwarz Information Criterion. The coefficients are significant at a 5 % significant level, thus leading to the result that the FDI and GDP series are cointegrated in long run. The ARDL is the model which is capable to handle the variables which are not integrated in the same order. The ARDL model can be used to assess the long-term relationship between the variables if part of them are integrated at the level and some at the first difference. The ARDL framework compares the estimated F-test result with the crucial values to determine whether there is a long-term relationship between the variables. If the targeted F-test value exceeds the upper bound value, the long-term relationship between the variables is accepted. If the F-value is in between the lower and higher bounds, the findings are not conclusive. If the calculated F-test value is less than the lower bound value, we reject the incidence of long-run linkage among the variables.

Table 6: Long Run Bound Test

Dependent Variable	F-Test	Decision	Selected Model
F (EXP/GDP, OFDI, TO, EXCH)	13.91805	Cointegrated	ARDL(1, 2, 2, 2, 2)
F (OFDI/EXP, GDP,TO, EXCH)	8.054283	Cointegrated	ARDL(1, 1, 2, 0, 2)
F (GDP/ EXP, OFDI, TO, EXCH)	38.38539	Cointegrated	ARDL(2, 2, 2, 2, 2)
Critical value (percent))	Lower bound 1(0)	Upper bound 1(1)	
10%	2.525	3.56	
5%	3.058	4.223	
1%	4.28	5.84	

Source: The Author

Table 7: Long and Short-run Coefficients

	Long run coeff.			
Variables	Coefficient	Std. Error	t-Statistic	Prob.
GDP	0.092	0.008	11.258	0.000
OFDI	0.035	0.005	7.432	0.000
TO	12.994	10.745	1.209	0.244
EXCH	0.033	0.066	0.504	0.621
C	-6.765	1.278	-5.293	0.000
	Short-run coeff.			
ECT	-0.961	0.092	-10.469	0.000
D(GDP)	0.271	0.017	16.146	0.000
D(GDP(-1))	0.086	0.018	4.673	0.000
D(OFDI)	0.001	0.002	0.869	0.398
D(OFDI(-1))	-0.019	0.002	-8.730	0.000
D(TO)	42.099	3.998	10.531	0.000
D(TO(-1))	21.608	5.260	4.108	0.001
D(EXCH)	0.316	0.081	3.875	0.001
D(EXCH(-1))	0.441	0.083	5.320	0.000

Source: The Author

After determining if the variables are cointegrated, we must determine the long-run and short-run coefficients of the independent variables. The error correction term (ECT) is a measurement of how quickly a series adjusts from a short-run to a long-run equilibrium. The table also includes the ECT term. Long-term results are displayed in the table's upper section.

The long-run result indicates that the GDP and OFDI have a positive and significant influence on exports in Bangladesh which suggest that in the long run the exports of Bangladesh are influenced by the economic growth of the country and OFDI made in other countries. Likewise, in short-run, the impact of GDP is positive and significant while the impact of lagged OFDI is negative in short-run which suggests that in the short run, the exports of the country are positively led by the economic growth of the country while the exports are adversely affected by OFDI. The influence of exchange rate and trade openness is also positive and significant.

Our results regarding the positive impact of OFDI on exports are in line with Islam (2014); Faruk (2013) and Ahamed & Tanin (2010) who reported the positive influence of FDI on

Bangladeshian economic growth. Similarly, Reza et al. (2019); Ahmed (2009) and Islam (2019) found that exports play an important role in the economic growth of Bangladesh. Whereas, our results regarding the positive impact of economic growth on exports of the country are in contradiction with Ahmed (2009) who found the negative influence of exports on the economic growth of Bangladesh. Similarly, our results stand in sharp contradiction with Rahman (2015) who found a negative association between the FDI and the economic development of Bangladesh. Our results are also different from Islam & Sahajalal (2019) who are indifferent for the relationship between FDI and the economic development of Bangladesh.

Table 8: Diagnostic testing

Tests	P-value	Interpretation
Serial Correlation	0.1242	No Serial Correlation
Heteroscedasticity	0.8115	No Heteroscedasticity
Normality	0.45617	Normal Distribution
Functional Form	0.196	Correct Functional form

Source: The Author

Various diagnostic tests have been used in this section to ensure that the predicted models were free of any econometric problems. To be employed in ARDL modeling, the estimated models must not have serial correlation, heteroscedasticity, or functional form issues. The normality assumption must also be upheld in the ARDL framework to yield accurate findings. All of the aforementioned tests have been finished, and Table 6 displays the outcomes. It has been demonstrated through statistics and p-values that there are no significant econometric worries. The results demonstrate that the proposed model is devoid of serial correlation issues because the LM test does not let us acknowledge the existence of such issues. The null hypothesis of the Lagrange-Multiplier test for no autocorrelation in the series also does not get rejected as the p-value of Chi-Square is greater than 0.05. Thus, the series is not suffering from the problem of autocorrelation. Likewise, the White test denied the presence of heteroscedasticity in the calculated model.
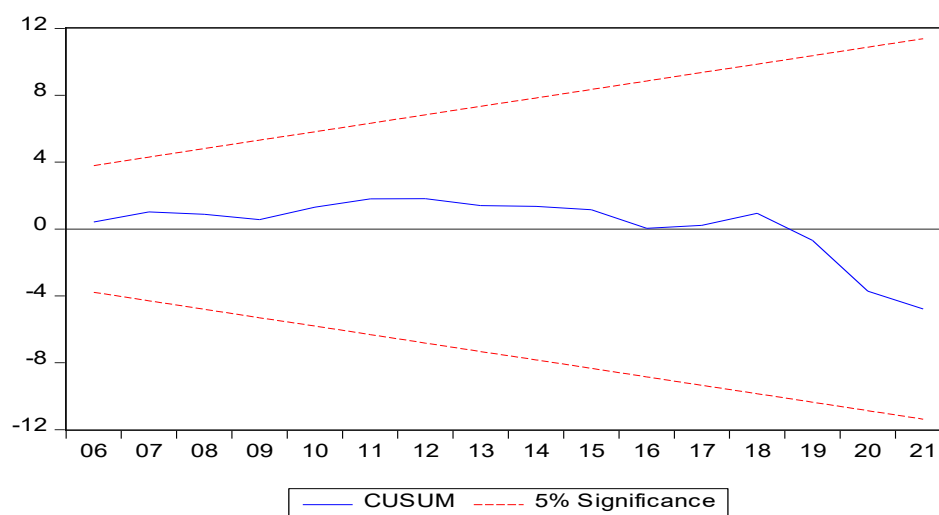
Source: The Author

Figure 1: CUSUM Test

The Jarque–Bera statistics also demonstrate the normality of data. Lastly, the estimated model is error-free because the Ramsey test is considered insignificant. Analysis of Stability in ARDL modeling, residual stability is critical. The CUSUM and square of CUSUM tests were

used to accomplish this. The graphs for both experiments are displayed in Figure 01. Both assessed lines are inside the critical lines at the 5% level of significance, according to the graphs. As a result, it is possible to conclude that the previously stated results are dependable and stable, and hence could be used to formulate policy.

Conclusion

Bangladesh, a part of the Indian sub-continent has made considerable progress in the last few decades in attracting FDI and increasing exports. But the last decades also saw a considerably increasing trend in outward FDI in Bangladesh. Thus, the present paper tests the relationship between outward FDI, exports and growth using data from 1990-2021. The novel estimation procedure of ARDL is used in the study to examine the long and short-run dynamics. Further, causal relationships between outward FDI, exports and growth are also examined. The findings suggest that there is a long-run cointegrating linkage between outward FDI, exports and economic growth in Bangladesh. Further, outward FDI positively contributes to enhancing the exports of the country. The coefficient of the Error Correcting term is also negative and supports the findings of the study. This suggests that Bangladesh's economic growth has been influenced by outward FDI and exports. Outward FDI has had a statistically significant positive effect on economic growth. The extent to which the outward FDI and labor force are employed in exporting industries is also critical for the manufacturing process, and as a result, economic growth will be stimulated. Similarly, openness to trade has had positive and considerable repercussions on economic growth, which is following our expectations. Thus, international trade in the economy creates reserves of foreign exchange, and as a result, plays its full role in boosting economic growth.

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