

The Impact of the Components of FDI Inflows on GDP Growth: An Empirical Analysis for Bangladesh

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ABSTRACT: This study seeks to assess the effects of the components of FDI inflows on GDP growth in Bangladesh covered the years 1997 to 2021. For this, three components of FDI (equity capital, reinvested earnings and intra company loans) along with labor force and trade openness have used in this analysis. By employing ARDL Bound Test, the coefficients of reinvested earnings and intra company loans provide a significantly positive relationship with GDP growth both in the short run and the long run. Whereas, the coefficient of equity capital has positive but insignificant impact on GDP growth in the long run. Besides, labor force and trade openness has positive and significant impact on GDP growth. Several diagnostics tests demonstrate that the model is normal, stable, and there is no serial autocorrelation or heteroscedasticity. The study suggests that FDI inducing policies will enhance the economic growth, mitigate the effects of the COVID-19 pandemic and meet up the sustainable development goals (SDG).

Key words: FDI, Equity Capital, Reinvested Earnings, Intra Company Loans, GDP Growth

Jel Classification: F43 O4

I. Introduction

Bangladesh is a rapidly growing economy in South East Asia with a sizable labor force. A potential tool for advancing the economy of Bangladesh is foreign direct investment (FDI). Inward FDI benefits a nation in several economic sectors including finance, technology, and human capital. As the majority of emerging nations are struggling with a lack of financial resources, technology and expertise, FDI inflows make a crucial role to boost their economic growth.

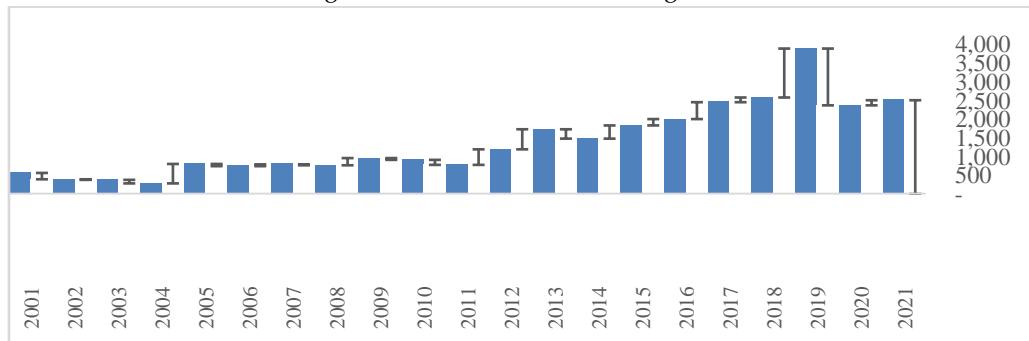
Theoretically, there is diversification that FDI could stimulate economic growth. Classical and neo-classical economic theory holds that the availability of capital, labor, and technology are necessary for economic progress. Neoclassical growth models contend that FDI expands the capital stock and fosters growth in the host economy (Brems, 1970) and Kida, 2014). Admittedly, FDI only has a "short-run" growth effect as economic progress towards a new steady state under neoclassical development models with diminishing returns to capital even though the acclimation process might take some time. As a result, FDI has the same effect on growth as domestic investment. In endogenous growth models, on the other hand, FDI is generally perceived to be more prolific than domestic investment. Hence, FDI promotes the adoption of new technology in the host country's industrial sector (Borensztein et al., 1998). Capital limitations, which limit investment and growth in developing nations like Bangladesh, can be offset by an influx of FDI from the foreign private or public sector.

Research has proven that FDI is a significant catalyst that has emerged as the most important source of foreign capital for emerging market economies. However, since the mid-1990s, the flow of public funding from developed to developing countries has been dropping globally while the influx of foreign private capital has increased over the last 10 years. As a result, Bangladesh had to compete for foreign investments with other developing and underdeveloped countries. Over the time, three factors are making Bangladesh an appealing location for FDI in South Asia (i) a sizable potential market due to high population density; (ii) rising purchasing power of the populace due to the emergence of the working middle class; and (iii) promising future economic prospects due to the high GDP growth rate. However, significant amounts of money are brought in through these investments establishing more industries.

The Global Economy estimates that as of 2020, Bangladesh's capital investment-GDP ratio is 30.47 percent. During 2019, FDI was USD 1.91 billion. At that time, Bangladesh received USD 4.48 billion in international and official development

aid. The IMF's Balance of Payment database reports that Bangladesh's net FDI inflow during the last ten years (2010-2019) stood at USD 20.5 billion that shows Bangladesh plainly has a much higher absorptive potential for FDI. According to Bangladesh Bank, the overall position of gross FDI inflow increased to USD 3883.26 million in 2021 from USD 3378.49 million in 2020. Due to the COVID-19 pandemic, many new projects were postponed, existing projects experienced significant delay and many other projects had their investment decisions frozen. As per World Investment Report (WIR) 2021, inward FDI to Bangladesh dropped to approximately 11.0 percent in 2020 to USD 2.56 billion from USD 2.87 billion in 2019. The amount of net FDI inflow in 2018 was USD 3.61 billion which was a record-high amount for the nation in a single year.

Figure 1: Total FDI Inflows in Bangladesh

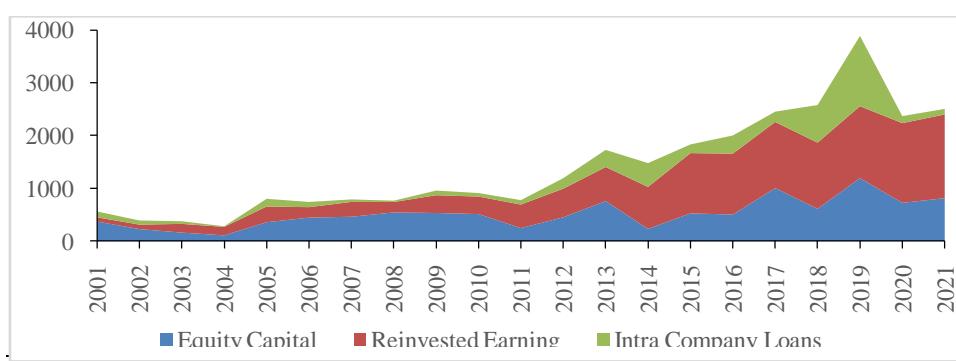


Source: Monthly Economic Trends, Bangladesh Bank

Figure 1 depicts Bangladesh's total GDP during the previous two decades. From 2001 to 2013, total FDI rose with sporadic volatility. The graph depicts the total FDI's consistent growth from 2015 to 2019. Once the Pandemic COVID-19, total FDI fell to 39 percent in 2020 and after that FDI started to rise.

Category-specific FDI in 2021 was USD 1224.15 million in equity capital, USD 1562.27 in reinvested earnings million and USD 1096.84 million in intra-company loans which was increased from USD 879.86 million, USD 1566.12 million and USD 932.51 million respectively in 2020. Bangladesh scored on the Innovation Index and the Economic Globalization Index were 20.2 and 29.14 respectively out of 100. According to the World Bank index for "Ease of Doing Business" in 2020, Bangladesh is ranked 168th out of 190 nations.

Figure 2: Component-wise FDI Inflows in Bangladesh



Source: Monthly Economic Trends, Bangladesh Bank

Figure 2 demonstrates the trends of FDI in Bangladesh by component wise. It shows an upward tendency for all three components from 2001 to 2019 with sporadic volatility, a dip caused by the COVID-19 pandemic, and then a slow resumption of growth.

Therefore, the primary goal of this research is to investigate the impact of FDI components inflow as well as other independent variables on Bangladesh's GDP growth. To show this impact, ARDL bound test approach has been used.

The rest of the paper will discuss in following: The next section is a review of the literature; Section 3 contains the methodology and estimation process; Section 4 examines the empirical results; and Section 5 concludes with policy recommendations.

II. Literature Review

Empirical research on the connection between FDI and economic growth are still many and diverse, both in advanced and developing countries.

Nistor, P. (2014) examined a correlation between FDI and economic growth for Romania after performing the Durbin-Watson test employing World Bank data from 1990 to 2012. Additionally, with a favorable impact on Romania's GDP, the number and quality of the inflows have a significant influence on how foreign investment affects the host nation.

Jibir, A., & Abdu, M. (2017) reveals that there is a one-way causal relationship between trade openness and per capita income, whereas, per capita income serving as a stand-in for economic development. The analysis used data for Nigeria from the Central Bank of Nigeria that covered the years 1970 to 2014 employing Granger Wald test and Vector error correction model. However, there is no direct relationship between FDI and Nigeria's economic growth in the short term.

A study by Agrawal, G., and Khan, M. A. (2011) explores that foreign direct investment (FDI) encourages economic growth and estimated that a 1.0 percent increase in FDI would result in a 0.7 percent rise in China's GDP and a 0.2 percent increase in India's GDP for the period of 1993 to 2009 using Ordinary Least Square (OLS) approach. The study also disclosed that FDI has a greater impact on China's growth than on India's, and that FDI is less important than other factors in predicting growth. The research gives potential explanations for China's impressive display of FDI as well as lessons India can take away for improved FDI use from China.

Meerza, S. I. A., & Imran, A. (2012) empirically examined the causal relationship between trade, FDI, and Bangladesh's economic growth over the years 1973 to 2008. The cointegration study indicates that these variables have a long-run equilibrium connection. The Granger causality test findings show that the aforementioned variables are causally related to one another. The analysis found a one-way causal relationship between FDI and export. This study demonstrates that the GDP of Bangladesh leads FDI and export growth by utilizing the Granger causality test. GDP will increase as a result, which will encourage export growth and also draw FDI.

Rahman, Z. U. (2014) studied for the effect of foreign direct investment (FDI) on Pakistan's economic growth using time series data from 1981 to 2010. They found that FDI and GDP are positively correlated, but CPI and FDI are negatively correlated. When FDI increases, FDI will have a beneficial impact on Pakistan's GDP.

Bashir, T. et al. (2014) demonstrate the effect of Chinese and South Asian foreign direct investment on the economies of Pakistan, India, Bangladesh and Sri Lanka from 1976 to 2011. They investigated the economic disparities between China and the South Asian region. The analysis showed that China's economy is expanding far more quickly than that of South Asia. Infrastructure development, a politically stable environment, peace and order, a good economic climate, a reduction in external debt, and tax exemptions are required for South Asian states to draw direct investment. The outcomes of the data analysis demonstrate the detrimental effects of FDI in Pakistan, Bangladesh, and India. Even while FDI and economic growth have a favorable link, the grave scenario calls for quick action to create an atmosphere that is welcoming to FDI in these states.

Iqbal, N. et al. (2014) found FDI and GDP in Pakistan are positively correlated using the data from 1983 to 2012 and employing the Cobb-Douglas production function. It is clear from Pakistan's literature that FDI inflow is not particularly big, but has been trending upward ever since Pakistan embraced market-oriented policies. These findings essentially show that Pakistan's ability to attract FDI and the degree to which FDI impacts GDP depend on its trade policy framework, which is export promotion policy.

Islam, M. S. et al. (2020) overviewed the contribution of Chinese Foreign Direct Investment to Bangladesh's economic growth from 2004 to 2017. This study uses multiple regression analysis to evaluate total Chinese direct investment and foreign direct investment in Bangladesh. Multiple regression analysis indicates that Chinese FDI has contributed to Bangladesh's economic growth. The results demonstrate a significant positive association between Bangladesh's GDP and Chinese direct investment. Bangladesh must develop its infrastructure and achieve political and legal stability in order to draw direct Chinese investment.

Hussain, M. E. and Haque, M. (2016) examined a link between trade, foreign direct investments, and the growth rate of Bangladesh's per capita GDP using annual time series data from 1973 to 2014. The Vector Error Correction Model

(VECM) methodology is used to show the long-term relationship between FDI and GDP. They showed that trade and foreign investment had a considerable impact on the growth rate of the GDP per capita.

Kisswani, K. M. et al. (2015) analyzed the relationship between foreign direct investment and real GDP in Estonia from 1994 to 2013 using Cointegration techniques. FDI and GDP are not stationary, according to the findings of the stationarity tests, and the variables are integrated on a first-order scale. The Engle-Granger method states that FDI and real GDP do not cointegrate. The Johansen cointegration test, which has a wider variety of applications than the Engle-Granger approach, confirms the cointegration of the real GDP and FDI series.

Reza, S. M. et al. (2018) investigate the relationship between FDI and Bangladesh's GDP growth using annual secondary data for the year of 1990 to 2015 employing cointegration and Vector Error Correction Model (VECM). This empirical research demonstrates that the issue of FDI inflows has played a crucial tool of Bangladesh's GDP growth, bringing in technological advancement, capital investment, and expertise that are also required for economic expansion.

From these empirical findings the effect of FDI on economic growth is relevant. The present endeavor is expected to analyze the impact of components of FDI (equity capital, reinvested earnings and intra company loans) on the economic growth of Bangladesh. For this fact, ARDL Bound test approach has been used as the sample size is small. As per our knowledge no other studies has been conducted on Bangladesh using the components of FDI. So this study will necessarily fill this gap.

III. Methodology

Model Specification

To explore the effect of FDI inflows on Bangladesh's economic growth, we proceed by analyzing the foreign direct investment along with other independent variables like trade openness (TO) and labor force (LF). We have segregated FDI inflows into three categories- equity capital (EC), reinvested earnings (RE) and intra company loans (ICL). We have used log form for all variables that depict the elasticity of the coefficients. Thus, the functional relationship among the variables can be expressed as in equation 1.

$$\text{LGDP}_t = \alpha_0 + \alpha_1 \text{LEC}_t + \alpha_2 \text{LRE}_t + \alpha_3 \text{LICL}_t + \alpha_4 \text{LTO}_t + \alpha_5 \text{LLF}_t + u_t \quad (1)$$

Here, α_0 is a constant term and u_t is the white noise error term.

Description of Variables

From the information of enterprise survey, FDI is comprised of three components: equity capital, reinvested earnings, and intra company loans. Equity capital defines as remittances received by incorporated or unincorporated direct investment firms/enterprises that are operating in Bangladesh on account of equity involvement in those enterprises by non-resident direct investors.

When transnational corporations (TNCs) generate money overseas, they might reinvest it in their affiliates or repatriate it to fund initiatives in their home nation or in other countries. The portion of profit retained for reinvestment is called reinvested earnings.

Intra-company loans, also known as intra-company debt transactions, are the short- and long-term borrowing and lending activities between direct investors and affiliate firms.

Equity capital (EC), reinvested earnings (RE) and intra company loans (ICL) have been used in terms of million USD. Trade openness is measured by trade as percentage of GDP. GDP in constant 2015 USD is used as GDP. Labor force is calculated by labor force participation rate for ages 15-24, total (percent) (modeled ILO estimate).

Data sources

In this study, data of equity capital (EC), reinvested earnings (RE) and intra company loans (ICL) sourced from the various issues of Monthly Economic Trends published by Bangladesh Bank. GDP, trade openness and labor force data have been gathered from World Development Indicator (WDI). Annual time series data from 1997 to 2021 have been used due to unavailability of data of equity capital, reinvested earnings and intra company loans before the period 1997.

Estimation Process

The present study uses autoregressive distributed lag (ARDL) bounds testing technique by Pesaran et al. (2001) to co-integration bounds test has a significant advantage over other co-integration approaches in that it does not need the variables to be integrated at the same level. Thus, I(0) or I(1) variables are suitable for looking for a co-integration relationship between them. Furthermore, this method might be used to data sets with a small number of observations.

The study employs an unrestricted error correcting model for this aim.

$$\Delta LGDP_t = \alpha_0 + \alpha_1 LEC_{t-1} + \alpha_2 LRE_{t-1} + \alpha_3 LICL_{t-1} + \alpha_4 LTO_{t-1} + \alpha_5 LLF_{t-1} + \sum_{i=1}^n \delta_i \Delta lgdp_{t-i} + \sum_{i=0}^m \delta_i \Delta lect_{t-i} + \sum_{i=0}^m \delta_i \Delta lret_{t-i} + \sum_{i=0}^m \delta_i \Delta liclt_{t-i} + \sum_{i=0}^m \delta_i \Delta ltot_{t-i} + \sum_{i=0}^m \delta_i \Delta llft_{t-i} + \omega ECM_{t-1} + u_{2t}$$

The above general equation can be split into two phases by ARDL bounds testing technique. The initial step is to estimate this unrestricted error correction model. The goal of this approach is to use the standard F-statistics to establish the long-term association between variables. The variables in this model are co-integrated if the estimated F-statistic value is greater than the upper bounds of critical value. On the other hand, the variables in this model are not co-integrated if the computed F-statistic is less than the lower boundaries of critical value. In addition, if the F-statistic value falls between the upper and lower boundaries, then the result is inconclusive.

IV. Result Analysis

Unit Root Test

We have checked each variable's unit root using Augmented Dickey Fuller (ADF) test and Phillips Perron (PP) test prior to conducting the co-integration. The following table 1 displays the unit root test result that shows the mixture of I(0) and I(1).

Table 1: Unit Root Test Result

Series	Level			1 st Difference		
	ADF Test	PP Test	Result	ADF Test	PP Test	Result
LGDP	0.980	0.087***	I(1)	0.964	-2.475**	I(1)
LEC	0.073***	0.000*	I(0)	-2.445**	-6.344	I(0)
LRE	0.898	0.000*	I(1)	-0.732	-5.885*	I(1)
LICL	0.107	0.000*	I(1)	-2.623**	-6.123	I(0)
LTO	0.409	0.004*	I(1)	-1.400	-4.123*	I(1)
LLF	0.363	0.014**	I(1)	1.772	-4.147*	I(1)

Note: *, **, *** depict 1 percent, 5 percent and 10 percent level of significance.

Result of ARDL Bound Test

Since there is an evidence of co-integration, the next step is bound test. From table 2, GDP has F-statistics = 7.76 with optimal lag p=1 which exceeds the upper bound (4.68) at the 1 percent level of significance. Hence, the result shows that the long run relationship between GDP and the components of FDI inflows.

Table 2: ARDL Bound Test Result

Bound Test: Unrestricted Constant and No Trend		
Dependent Variable: D(LGDP)		
Optimum Lag: (1, 0, 1, 1, 0, 0)		
F-statistic: 7.76*		
I(0)	I(1)	Significance
2.26	3.35	10percent
2.62	3.79	5 percent
3.41	4.68	1 percent
Note: * depicts the 1percent level of significance		

ARDL Short run and Long run Results

From the result of the long run estimation in table 3, equity capital yields positive but insignificant coefficient. This could arise due to non-resident direct investors' small investing activity, unobserved performance of unlisted companies and unorganized sector and madness of equity market like bull, bear markets, long term bets, short term volatility, occasional overheating and eventual market corrections.

While, the estimated coefficient of reinvested earnings is 0.097, has a positive significant effect on GDP of Bangladesh. This implies that a 1 percent increase in reinvested earnings will raise GDP 0.097 percent. More so, the coefficient of intra company loan is 0.044 has found a positive significant effect on GDP in Bangladesh. If intra company loan increase 1 percent, GDP of Bangladesh will increase 0.044 percent.

Trade openness exerts positive and significant effect on GDP. The coefficient supports that a 1 percent increase in trade openness will increase GDP 0.11 percent. Moreover, the positive coefficient of labor force is 2.154. This indicates that if labor force rise 1 percent, GDP of Bangladesh will increase 2.15 percent.

Table 3: Long run relationship

Variables	Coefficients	t-statistics
LEC	0.001	0.056
LRE	0.097	4.057*
LICL	0.044	3.545*
LTO	0.119	2.080*
LLF	2.154	12.265*

LGDP= 0.001LEC +0.097LRE +0.044LICL + 0.119LTO + 2.155LLF

Note: * depict 1percent level of significance respectively.

The short run dynamic of the model presented is in table 4. The coefficient of reinvested earnings has a positive and significant effect on GDP. Also, the coefficient of intra company loans reveals positive sign (0.006) which is relatively lower than its long run counterpart. Error correction term holds the theoretically correct sign which is negative. This indicates that the economy will correct its disequilibrium at 28 percent speed in every year.

Table 4: Short run relationship

Variables	Coefficients	t-statistics
Constant	-3.808	-7.764*
ΔLRE	0.013	2.067*
ΔLICL	0.006	3.293*
ECT	-0.275	-7.877*
R-squared	0.782	
Adjusted R-squared	0.749	
F-statistic	23.895	

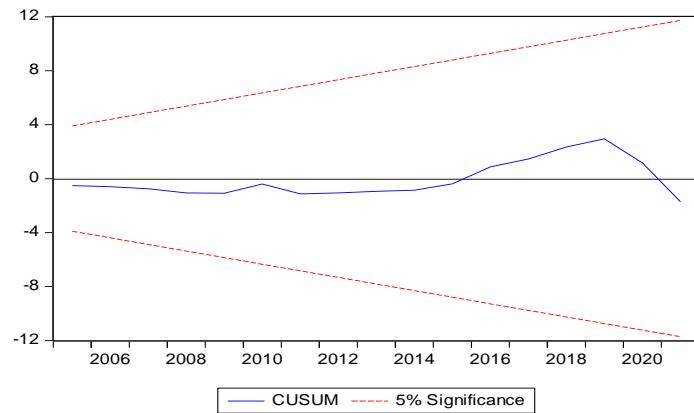
Note: *depict 1percent level of significance respectively.

We can conclude that components of FDI inflows have short and long run effect on GDP of Bangladesh by employing additional labor and by enhancing the trade openness that could promote economic growth.

The Validity of the Model

R² value is 0.78 which indicates the goodness of fit of the estimated model. Besides, adjusted R² value of c 0.75 shows that the model has a very good explanatory power. The outcomes of the Breusch-Godfrey LM test and Breusch-Pagan-Godfrey test imply that the model is free from serial autocorrelation and heteroscedasticity problem. Jarque-Bera test means depicts the estimated model is normal.

Test	F-statistics	Probability
Breusch-Godfrey Serial Correlation LM Test	2.243	0.162
Heteroskedasticity Test: Breusch-Pagan-Godfrey	0.167	0.998
Normality Test: Jarque-Bera	2.876	0.237
Stability Test: CUSUM	Stable	



V. Conclusion & Policy recommendation

This study examines the impact of the components of FDI inflows on GDP growth in Bangladesh using annual time series data from 1997 to 2021 employing the ARDL approach. The unit roots of each variable were tested for stationary tendency using Augmented Dickey Fuller (ADF) and Phillips Perron (PP) tests. The ARDL Bound test demonstrates the long-term relationship between GDP and components of FDI inflows. Equity Capital (EC) shows a positive but insignificant impact in the long run estimation. The reinvested earnings (RE) and intra-company loan (ICL) coefficients have a positive, significant impact on Bangladesh's GDP. Additionally, GDP is positively and significantly impacted by both the labor force and trade openness. Reinvested earnings (EC) have a positive and considerable impact on GDP in the short term of the model. Intra-company loans (ICL) have also a positive impact in short-run. Error correction term suggests that the economy will restore its equilibrium at 28 percent in every year. Therefore, Bangladesh should take some policy measures to concentrate on raising productivity through growing human capital, eliminating inefficiencies, and other policies directed towards the long-term growth of Bangladesh. The following policy actions should be implemented to guarantee the flow of FDI into Bangladesh:

1. Establishing an exclusive economic zone and enhancing the quality of the infrastructure and human resource, Bangladesh will be able to attract more foreign investors.
3. Encouraging international investors to choose the nation as their investment hub, the government should provide one-stop services.
4. Promoting free trade as FDI may give the local economy better access to innovations.
5. Enhancing competitiveness and sustainability of economic and regulatory reform, so that it can be more successful in attracting FDI at an accelerated rate.
6. Financial regulators such as the Central bank and the National Board of Revenue and the Securities and Exchange Commission should address the issues efficiently in FDI inflow for the interest of the economy.

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