Foreign Direct Investment in Bangladesh: An Empirical Analysis on its Determinants and Impacts

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Abstract:

In this paper, the catalyst variables of FDI inflows in Bangladesh are examined by applying extreme bounds analysis to the time series data from 1990-91 to 2005-06. The results reveal that wage, trade openness, net export, GDP growth and tax rate have robust result. Also two years lagged values of FDI and change in the level of domestic investment are found to have a positive effect on economic growth.

JEL classification:

F14, F21, F43,

Keywords:

Capital investment, economic growth, crowding out and crowding in, gross domestic capital formation, tariff etc.

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I. Introduction:

According to UNCTAD world investment report 2006, foreign direct investment (FDI) is defined as an investment involving a long-term relationship and reflecting a lasting interest and control by a resident entity in one economy (foreign direct investor or parent enterprise) in an enterprise resident in an economy other than that of the foreign direct investor (FDI enterprise or affiliate enterprise or foreign affiliate).FDI implies that the investor exerts a significant degree of influence on the management of the enterprise resident in the other economy. Such investment involves both the initial transaction between the two entities and all subsequent transactions between them and among foreign affiliates, both incorporated and unincorporated. FDI may be undertaken by individuals as well as business entities and has three components, namely equity capital, reinvested earnings and intra-company loans.2

Foreign private investment has a number of economic effects on the host country which benefit both the domestic industry as well as the consumer, by providing opportunities for technological transfer and upgradation, access to global managerial skills and practices, optimal utilization of human capabilities and natural resources, making industry internationally competitive, opening up export markets and diversify production and export capacities, providing backward and forward linkages and access to international quality goods and services and augmenting employment opportunities. So, in the light of the above potential benefits, FDI is regarded as an important vehicle for economic development particularly for developing economies and if channeled properly, FDI can contribute to capital formation in the developing host economy.

Equity capital is the foreign direct investor's purchase of shares of an enterprise in a country other than its own; reinvested earnings comprise the direct investor's share (in proportion to direct equity participation) of earnings not distributed as dividends by affiliates, or earnings not remitted to the direct investor. Such retained profits by affiliates are reinvested and intra-company loans or intra-company debt transactions refer to short- or long-term borrowing and lending of funds between direct investors (parent enterprises) and affiliate enterprises.

Due to the reasons mentioned above, there is intense competition amongst countries, especially amongst the developing countries of the same region, to attract FDI and host countries offer a wide range of incentives and concessions for this. The incentives offered can broadly be classified as, fiscal incentives(reduce the tax burden of foreign investors); financial incentives(government grants, subsidized credit, duty free import of materials, government equity participation and insurance at preferential rates); other non-financial incentives(infrastructure facilities and other services at subsidized rates; market preferences and preferential treatment on foreign exchange, setting up free trade zones or export processing zones where all sorts of incentives are provided to attract export-oriented FDI) .The costs involved in providing these incentives are the loss of tax revenue for host governments, distortions in the production structure of the host economy and high costs in administering these incentives.

However, incentives, at the same time, can be used effectively by developing country governments to channel investment into desirable industries or regions. If designed carefully they can also be used to influence the character of the investment, such as ensuring inflow of technology intensive investment. Developing country governments can design their FDI incentive package from a large choice of different types of incentives and whether there is a net benefit to the economy from offering FDI incentives depends largely on the administration and implementation of such incentives. In 2006, 147 policy changes making host-country environments more favorable to FDI were observed. Most of them (74%) were introduced by developing countries. They included in particular measures aimed at lowering corporate income taxes (as in Egypt, Ghana and Singapore) and expanding promotional efforts (as in Brazil and India). Further liberalization of industries that relating to professional services (Italy), telecommunications (Botswana and Cape Verde), banking (the Lao People's Democratic Republic and Mali) and energy (Albania and Bulgaria) were done.

Although there is substantial evidence that foreign investment benefits host countries, they should assess its potential impact carefully and realistically. The central question about foreign investment is whether it complements or replaces domestic

investment. If there is additional investment through FDI which would have not been undertaken without FDI, a net positive balance in employment will result (crowding in). If, on the other hand, local firms are taken over by foreign investors which rationalize and downsize the workforce, the balance of FDI on employment will be negative. The same will apply if foreign subsidiaries out-compete domestic enterprises (crowding out). As subsidiaries of foreign firms have direct access to modern technology, management skills, links to the world market and financial resources, they tend to be more productive and more competitive in comparison to domestic companies of developing countries. If spillovers to local firms do not take place on a sufficient scale, subsidiaries will realize a long-term competitive advantage, displacing local competitors who lack the necessary relationships, resources and skills to catch up. Such a situation will tend to increase unemployment, foster concentration of market power, and channel a higher share of the domestic economy's profits into the hands of foreign investors.

The promotion of growth and development in the third world states is seen as one of the most fundamental problems confronting the world today and among the most fundamental principles in economics is that economic growth requires capital investment. To deal with the problem, many underdeveloped states turned to the developed capitalist countries for foreign investment which is considered as one of the most resilient and reliable source of capital inflow that they hope will lead to growth and prosperity. So, understanding the determining factors of FDI inflows and unveiling the reasons why some countries are more successful than others in attracting FDI may provide policy makers with useful guidance for future policy prescription. Despite liberalization in some sectors and recent efforts in establishing Bangladesh as an attractive location for FDI in South Asia, it has not been quiet successful in attracting foreign investment because of its poor infrastructure and a weak business environment (World Bank, 2006) and also as Bhattacharya(2005) suggested, so far FDI has not decisively contributed to reducing the two key weaknesses of Bangladesh: high unemployment and widespread poverty, coupled with a scarcity of foreign exchange.

Objective:

This paper is designed to accomplish the following specific objectives:

1. To evaluate the FDI performance in case of Bangladesh
2. To find out the key determinants of FDI flows to Bangladesh economy and the relationship between FDI and macro economic fundamentals in Bangladesh.
3. Analyze the effect of FDI inflow on the economic growth of Bangladesh.

II. Sources of data:

Keeping the above objectives in mind, mainly a desk research is conducted based on secondary time series data from 1990-91 to 2005-06 on selected economic indicators of Bangladesh. The data are mostly obtained from the Economic trends, published by the statistics department of the central bank of Bangladesh, official website of the central bank, ministry of finance, World investment report 2006 and 2007 published by United Nations Conference on Trade and Development and official website of World Bank.

III. Structure and Methodology:

Rest of the paper is structured in the following way. In section IV, some recent literatures on the determinants and economic impact of FDI are reviewed. In section V, this paper tends to evaluate the historical performance of FDI flow to Bangladesh by some selected indices, namely FDI as percentage of GDP, FDI as percentage of gross capital formation, FDI performance and potential index. In section VI, this paper attempts to find out the determinants of FDI inflow to Bangladesh in the light of extreme bound analysis and having done this, this paper then turns to evaluate the impact of the FDI flow on the economy of Bangladesh with an ordinary least square regression model in section VII.

IV: Review of previous research:

There is a vast body of empirical literature on whether foreign direct investment is beneficial to host country's growth or not and has shown the likelihood that the, market size, trade policy regime followed by host countries development policies influences significantly both the amount of inward FDI received by recipient countries and the impact of foreign direct investment on growth.

Bosworth and Collins (1999) distinguished among three types of inflows: FDI, portfolio investment, and other financial flows (primarily bank loans) by their effect on domestic investment for 58 developing countries during 1978-95 covering nearly all of Latin America and Asia, as well as many countries in Africa. The authors found that an increase of a dollar in capital inflows is associated with an increase in domestic investment of about 50 cents. This result, however, masks significant differences among types of inflow. FDI appears to bring about a one for- one increase in domestic investment; there is virtually no discernible relationship between portfolio inflows and investment (little or no impact); and the impact of loans falls between those of the other two and these results hold both for the 58-country sample and for a subset of 18 emerging markets.

Borenszteina et al (1998) tested the effect of foreign direct investment (FDI) on economic growth in a cross-country regression framework, utilizing data on FDI flows from industrial countries to 69 developing countries over the last two decades. Their results suggest that FDI is an important vehicle for the transfer of technology, contributing relatively more to growth than domestic investment. Moreover, they found that FDI is more productive than domestic investment only when the host country has a minimum threshold stock of human capital or when there is a sufficient absorptive capability of the advanced technologies is available in the host economy. Their results were also supportive of a crowding-in effect, that is, a one-dollar increase in the net inflow of FDI is associated with an increase in total investment in the host economy of more than one dollar, but do not appear to be very robust.

In their paper Alfaro and Charlton (2007) attempted to distinguish different qualities of FDI to re-examine the relationship between FDI and growth. They used 'quality' to mean the effect of a unit of FDI on economic growth. Exploiting a comprehensive, industry level data set for the period 1985-2000 that encompasses 29 countries to examine the various links between different "types" of FDI and growth, they found that FDI at the industry level are associated with higher growth in value added. The relation is stronger for industries with higher skill requirements and for industries more reliant on external capital.

Luiz(1999) showed that the extent to which FDI is growth enhancing depends on the degree of complementarity and substitution between FDI and domestic investment. FDI is growth enhancing in the long run, via both knowledge transfers and the accumulation of capital stocks embodying newer technologies, then this impact is likely to be lower in technological leaders than laggards. As a result, the impact of FDI on growth seems to depend inversely on the technological gap between leaders and followers. The degree of substitutability between capital stocks embodying old(domestic) and new(FDI related) technologies seems to be higher in technologically advanced recipient, economies and the degree of complementarity between old and new technologies found in developing economies.

Soysa and Oneal(1999) studied the growth in per capital income for 114 countries, focusing on a sample of 97 developing countries for the years 1980-1991 and found strong evidence that foreign direct investment provides important direct and indirect benefits for host countries. They used Granger tests of causality to show that the two sources of investment are complimentary. An increase in foreign direct investment encourages greater investment from domestic sources(1:2.89 percent).New domestic investment also encourages new foreign investment, but the effect is much smaller(1:17 percent).

Rothgeb (1984) attempted to explore the impact of foreign investment on growth in the third world and he concluded that the effects of foreign investment are different for

differing types of third world states. Examining a sample representing the entire third world, total stocks were found to be negatively related to overall growth in the long run. Total flows and flows in manufacturing and domestic trade had an initial disruptive effect that was followed by a later period of growth.

Agosin and Mayer(2000) showed that the positive impacts of FDI on domestic investment are not assured. In some cases, total investment may increase much less than FDI, or may even fail to rise when a country experiences an increase in FDI. This paper assesses the extent to which foreign direct investment in developing countries crowds in(when FDI stimulates new downstream or upstream investments that would not have taken place in their absence) or crowds out domestic investment. (whether FDI displaces domestic producers or pre-empting their investment opportunities.) The econometric exercises conducted in the paper suggest that, over a long period of time (1970–1996), crowding in has been strong in Asia, and crowding out has been the norm in Latin America. In Africa, FDI has increased overall investment one-to-one.

By reviewing recent theoretical and empirical work on FDI's impact on developing countries' investment and growth, Loungani and Razin (2001) questioned the preference for FDI over other forms of private capital inflows. They pointed to some potential risks of FDI on developing host country, like it can be reversed through financial transactions; its benefits can be limited by leverage; and a high share of FDI in a country's total capital inflows may reflect its institutions' weakness rather than their strength.

Blongien and Wang (2004) established the fact that the nature, volume and impact of FDI in DCs and LDCs are very different. They found that the underlying factors that determine the location of FDI activity across countries vary systematically across LDCs and DCs; the effect of FDI on economic growth is one that is only supported for LDCs in the aggregate data, not DCs; FDI is much less likely to crowd out (more likely to crowd in) domestic investment for LDCs than DCs.

Despite the vast body of literature suggesting that foreign direct investment is linked with economic environment of the host country, but still there is no widely accepted set of explanatory variables that can be regarded as the "true" determinants of FDI. Chakrabarti (2001) concluded that "the relation between FDI and many of the controversial variables (namely, tax, wages, openness, exchange rate, tariffs, growth and trade balance) are highly sensitive to small alterations in the conditioning information set" and the underlying theory does not provide a definite prediction for the direction of the effect of a particular variable on FDI. To facilitate the empirical analysis of FDI, he proposes a structural model designed to assess the role of various potential determinants of the spatial distribution of FDI in terms of its potential determinants. In order to do that, he studied large number variables that have been the focus of attention in a broad collecting of works on the determinants of FDI. and also their statistical relationships with FDI

Moosa (2005) also followed a similar approach to examine the determinants of FDI inflows in (predominantly Arab) MENA countries, which have been remarkably unsuccessful in attracting FDI. By applying extreme bounds analysis to a sample of cross-sectional data covering 18 countries, he showed that countries that are more successful in attracting FDI are those countries that have growing economies, that pay attention to education and research, that have low country risk and that have high return on capital due to the lack of domestic investment in fixed capital.

Despite a number of recent studies aimed at finding the determinants and performance of FDI, it still remained a matter of controversy. No consensus view could be reached regarding the true and most crucial determinants attracting foreign investment flow in Bangladesh and also there are strong arguments in the country against equal treatment for foreign investors compared with domestic producer, their unrestricted activity and the long term impact of their investment on the economy of Bangladesh. This study will attempt to address these issues.

VI: Certain Indicators of FDI Performance in case of Bangladesh:

FDI/GDP Ratio:

FDI normalized by the size of the host economy which is an indicator of the attractiveness of an economy to draw FDI. A country with a ratio of FDI to GDP that is greater than unity is reckoned to have received more FDI than that implied by the size of its economy. It indicates that the country may have a comparative advantage in production or better growth prospects reflecting larger market size for the foreign firm. On the other hand, a country that has the ratio value of less than one may be more protectionist and technologically backward, or may possess a political and social regime that is not conducive for investments. Overall, FDI-GDP ratio is an index of the prevailing investment climate in the host economy. Table 1 provides this index in case of Bangladesh.

Inward FDI Flows as a Percentage of Gross Fixed Capital Formation:

A common measure of the relative size of FDI is the "FDI/capital formation ratio," given by the amount of FDI inflows in one year divided by the total fixed asset investments made by foreign and domestic firms in the same year. FDI flows expressed as a percent of GDCF can provide a crude measure of the importance of FDI in an economy's capital formation. Table 1 provides the share of inward FDI inflows as a percentage of GFCF in case of Bangladesh and it measures the relative weight of FDI in total aggregate investment taking place in the economy.

TABLE 1: FDI/GDP and FDI/Gross Fixed Capital Formation (%)

Year	FDI/GDP	FDI/GFCF(%)
1990-91	0.00001	0.1
1991-92	0.00003	0
1992-93	0.00012	0.1
1993-94	0.00041	0.2
1994-95	0.00029	0.2
1995-96	0.00226	1.1
1996-97	0.00548	2.6
1997-98	.01305	5.8
1998-99	.01260	5.5
1999-00	0.00656	2.8
2000-01	.01232	5.2
2001-02	0.00746	3.1
2002-03	0.00632	2.7
2003-04	0.00620	2.5
2004-05	0.00762	3
2005-06	.01117	4.6

The above table clearly indicates that over the years Bangladesh had not been able to attract a substantial amount of foreign investment inflow compared to its size. Not only that, foreign investment as percentage of total capital formation is also considered very poor and unstable.

Inward FDI Performance Index:

The Inward FDI Performance Index of the UNCTAD is an instrument to compare the relative performance of countries in attracting FDI inflows. It is the ratio of a country's share in global inward FDI flows to its share in global GDP. An index value greater than one indicates that the country receives more FDI than its relative economic size given by its relative GDP, a value below one that it receives less(a negative value means that foreign investors disinvest in that period). The index captures the influence on FDI of factors other than market size. These other factors can be diverse, ranging from the business climate, economic and political stability, the presence of natural resources, infrastructure, skills and technologies, to opportunities for participating in privatization or the effectiveness of FDI promotion. Table 2 provides the ranking of Bangladesh according to this index among 140 selected countries.

$$\mathbf{IND_B = (FDI_B/FDI_w)/GDP_B/GDP_w}$$

Where,

IND_B = The Inward FDI Performance Index of Bangladesh

FDI_B = The FDI inflows in Bangladesh

FDIw = World FDI inflows

GDP_B = GDP of Bangladesh

GDPw = World GDP

Table 2: Ranking of Bangladesh according to Inward FDI performance index

Inward FDI performance index			
Year	Rank	Index value	
1990-92	126	0.012	
1992-94	129	0.035	
1994-96	131	0.021	
1996-98	131	0.156	**<1**
1998-00	121	0.139	
2000-02	128	0.096	
2002-04	122	0.263	
2003-05	119	0.459	
2004-06	121	0.428	

Inward FDI Potential Index:

The Inward FDI Potential Index of the UNCTAD is an instrument to compare the relative potentials of different countries in attracting FDI inflows on the basis of some selected variables that capture the host of socio-economic factors (apart from market size) affecting inward FDI flows and it tries to determine the potential for FDI for each of the 140 selected countries, on the basis of the chosen variables. It is an average of the values (normalized to yield a score between zero, for the lowest scoring country, to one, for the highest) of 12 variables.3 Table 3 provides the ranking of Bangladesh according to this index.

3 The variables are: (1) Per capita GDP. (2) The rate of GDP growth over the previous 10 years. (3) The share of exports in GDP. (4) As an indicator of modern information and communication infrastructure, the average number of telephone lines per 1,000 inhabitants and mobile telephones per 1,000 inhabitants. (5) Per capita Commercial energy use. (6) The share of R&D spending in GDP. (7) The share of tertiary students in the population. (8) Country risk. (9) The world market share in exports of natural resources. (10)The world market share of imports of parts and components for automobiles and electronic products. (11) The world market share of exports of services, . (12) The share of world FDI inward stock

Table 3: Ranking of Bangladesh according to Inward FDI potential index

Inward FDI potential index			
Year	Rank	Index value	
1990-92	113	0.121	**<1**
1992-94	107	0.131	
1994-96	110	0.131	
1996-98	111	0.132	
1998-00	110	0.123	
2000-02	117	0.123	
2002-04	117	0.119	
2003-05	119	0.111	

Comparing Performance and Potential:

UNCTAD ranks countries by how they do in attracting inward direct investment based on inward FDI performance and potential index. Comparing the two indices, a four-fold matrix of inward FDI performance and potential is drawn up.

	High FDI performance	Low FDI performance
High FDI Potential	Front-runners	Below potential
Low FDI Potential	Above potential	Under-performers

Both the FDI performance and potential index for Bangladesh had consistently been weak (lower than 1) and as the above matrix suggest, Bangladesh had been ranked as an under-performer throughout the sample period having low FDI performance as well as low FDI potential.

VII: Major determinants of FDI inflows to Bangladesh

Foreign investors invest in developing countries primarily to take advantage of the low cost of land and labor in developing countries, to gain access to their domestic markets and to take advantage of developing countries' comparative advantage for diversifying their production and investments. Some of the key characteristics of host countries that are crucial in determining the flows of FDI are highlighted below:

- Cheap and efficient labor in developing countries.
- Good transportation and communication networks.
- Macroeconomic and political stability.
- Large domestic market for goods and services, sustained rates of growth in these markets and also access to regional markets.
- Efficient policy and regulatory environment and a positive attitude of government and investment promotion agencies.

Irrespective of the underlying hypothesis or the classification of these and some other variables, Chakrabarti (2001) puts forward the following examples from existing empirical studies which have considered different combinations of these variables with mixed results, not only with respect to the importance (statistical significance) but in terms of the direction of the effect.

- Most of the studies reporting a significantly negative coefficient on the wage rate (labor cost) combine it with the growth rate, inflation and trade deficit. Those reporting a positive coefficient combine wages with taxes and openness.
- The growth rate has been found to have a significantly positive effect on FDI if it is combined with inflation, trade deficit and wages.
- Tariffs have a positive effect on FDI if they are combined with the growth rate and openness, but they produce a negative effect when combined with wages.
- The real exchange rate produces a positive effect when it is combined with openness, domestic investment and government consumption. When domestic investment is excluded, the effect becomes negative.

The problem is that there is no theoretical reason for a particular combination of variables to produce coefficients of a particular sign. Moreover, even if some theoretical reasoning is valid for a particular country or group of countries, it may not be valid for all countries. In their study, both Chakrabarti (2001) and Moosa (2005) used the technique of extreme bounds analysis by Leamer (1983, 1985), which is designed specifically to deal with this problem.

Extreme Bounds Analysis:

Cross-sectional studies of the determinants of (inward) FDI are typically based on a regression of the form:

$$FD_i = C + \Sigma\alpha X_{ji} + \varepsilon_i$$

where FDI_i is inward foreign direct investment flows into country i and x_{ji} is the jth explanatory variable of country i. These studies report a sample of regressions, including a certain set of explanatory variables. The problem is that theory (particularly the theory of FDI) is not adequately explicit about the variables that should appear in the "true" model. The following problem is often encountered: x_1 may be significant when the regression includes x_2 and x_3, but not when x_4 is included.

EBA is applied to a linear regression that is used to explain FDI. The model takes the form of

$$FD_i = C + \alpha X_i + \Sigma\beta Q_{ji} + \Sigma\gamma Z_{ji} + \varepsilon_i$$

where X_j is the least controversial explanatory variable that has been the focus of past empirical studies on the determinants of FDI and is included in every regression, Q is the variable of interest whose robustness is under examination, and Z is a subset of potentially important variable that also need to be controlled. The X 's are called the free variables, whereas Q is called the variable of interest and Z's are called doubtful variables.

An exhaustive number of regressions are run, such that each regression contains the free variables (X), the variable of interest and a combination of maximum three of the Z variables, chosen from the predetermined pool to find the widest range of coefficients on the variable of interest, β that standard hypothesis tests do not reject at a particular significance level. The relationship between the dependent variable and a given explanatory variable is considered to be robust if the extreme values, β_{max} and β_{min} remains statistically significant and maintains the same sign when the set of explanatory variables are changed. Otherwise, the variable is described as being "fragile.

Description of data:

X-variable (free variable):

The X-variable is chosen on the basis of its general acceptance in past empirical studies and economic theory and this is the host countries market size or GDP. Market size has been the most widely accepted as a significant determinant of FDI flows. The market size hypothesis upholds that larger countries should receive more flows than smaller countries and a large market is necessary for efficient utilization of resources and exploitation of economies of scale.

Q-variables (variable of interest):

The Q-variables (variables of interest) include the host country's wage (W), trade openness (TOP), real exchange rate (REX), import tariff (TARRIF), trade balance (NX), growth rate of real GDP (GRGDP) and tax rate on income and profit (TAX).

WAGE= wage rate at current market price; Labor price is an important factor in attracting multinationals. Higher host country wages discourages inbound FDI and vice versa.

TOP= sum of import and export to GDP; Given that most investment projects are directed towards the tradable sector, a country's degree of openness to international trade should be a relevant factor in the decision.

FEX= Exchange rate; The weaker the currency of a country the less likely it is that foreign firms will invest in that location because an income stream from a country with a weak currency is associated with an exchange rate risk

TARRIF= average tariff on intermediate and final goods; To avoid obstacles in trade, resulting from the imposition of tarrif, foreign investment is undertaken in the country to which it is difficult to export because of tariff obstacles. Trade liberalization allows goods to move freely and hence is expected to reduce the amount of FDI.

GRGDP= growth rate of GDP on an annual percentage basis; A rapidly growing economy provides relatively better opportunities for making profits than the ones growing slowly or not growing at all.

NX=value of exports less imports at current market price; A trade surplus is indicative of a dynamic and healthy economy with export potential and is therefore likely to encourage FDI.

TAX= taxes on income, profits and capital gains as percentage of current revenue; The literature remains fairly inconclusive.

Z variables (doubtful variables):

The pool of variables from which the Z variables(doubtful variables) are chosen, include all the Q variables and inflation(INF), budget deficit(BDEF), domestic investment(DINV), external debt(EDEBT), government consumption(GCON).

Now that the free variables have been selected, one of the *Q* and maximum three of the *Z* variables are selected from predetermined pool. The procedure followed for this purpose is as follows. Each of the seven Q variables is selected as the variable of interest, in turn. For a given *Q* variable, a combination of three *Z* variables (maximum) is selected from the remaining eleven.

Table 4: Sensitivity results for the Q variables on FDI

Q-variable	β		t	Adj R^2	F	Z-variables	Robust
Wage	β_{max}	-1.02	-3.21 (.0084)	.75	12.09 (.0005)	**INF, FEX**	Yes
	β_{min}	-.398	-2.36 (.038)	.80	16.15 (.0001)	**GRGDP, NX**	
TOP	β_{max}	7316.24	3.32 (.008)	.78	11.96 (.0006)	**NX, TAX, TARRIF**	Yes
	β_{min}	3289.12	2.45 (.034)	.87	20.29 (.00006)	**GRGDP, BDEF, EDEBT**	
FEX	β_{max}	66.79	2.93 (.01)	.75	12.09 (.0005)	**WAGE, INF**	No
	β_{min}	-41.65	-2.26 (.047)	.78	11.85 (.0006)	**TARRIF, NX, GRGDP**	
TARRIF	β_{max}	-47.69	-2.40 (.037)	.85	17.87 (.0001)	**WAGE, GRGDP, INF**	No
	β_{min}						
NX	β_{max}	.25	2.33 (.006)	.78	11.85 (.0006)	**TOP, BDEF, TARRIF**	Yes
	β_{min}	.16	2.67 (.0233)	.92	37.57 (.000004)	**INF, EDEBT, TOP**	
GRGDP	β_{max}	-37.28	-3.54 (.005)	.78	11.85 (.0006)	**NX, TARRIF, FEX**	Yes
	β_{min}	-.23.87	-2.37 (.039)	.82	14.84 (.0002)	**WAGE, INF, FEX**	
TAX	β_{max}	-51.55	-2.43 (.035)	.80	13.28 (.0004)	**NX, GRGDP, DINV**	Yes
	β_{min}	-39.31	-2.17 (.05)	.80	13.01 (.0004)	**NX, GRGDP, BDEF**	

**The p value is provided in the parentheses below the t and F statistics.

Analysis of the findings:

First of all, our result confirms the market size hypothesis. In case of all the Q variables and the combinations of Z variables, statistically significant positive relationship was found between FDI and GDP of Bangladesh, except a very few exceptions.

And according to the extreme bound analysis, we tried to find the widest range of coefficients on the variable of interest, β that standard hypothesis tests do not reject at a particular significance level. If the extreme values remain significant and of the same sign, then the result (and hence, the variable of interest) is considered to be robust.

According to the criteria mentioned above, the countries wage rate has negative, trade openness has positive, trade balance has positive and tax rate has negative impact on the flow of foreign direct investment and all these relationships were statistically significant at 95% level of significance and was found to be robust. These relationships also comply with the traditional hypothesis.

In case of growth rate of GDP, which is supposed to be positively related with FDI, our result gives an opposite relationship, but both statistically significant and robust. In case of the other two variables of interest, exchange rate and tariff, we didn't get any robust result.

Foreign direct investment and growth:

There are several schools of thoughts regarding impact of foreign investment upon third world states. Determining the effects of stocks and flows is rendered difficult not only by these varying empirical results, but also by methodological problems. In general most previous research has not employed time-lagged analysis. We used the model by Rothgeb (1984) to explore the impact of lagged foreign investment on growth of Bangladesh. Seven variables namely, flows of foreign investment (FDI), stocks of foreign investment (SFI), gross domestic fixed capital formation (DINV), growth in gross domestic capital formation (dDINV), total population (TPOP), population growth (dTPOP) and GDP. Standard regression is used to examine the effects of the independent variables on overall growth.

$$dGDP = a + \beta_1 FDI + \beta_2 SFI + \beta_3 DINV + \beta_4 dDINV + \beta_5 TPOP + \beta_6 dTPOP + \beta_6 GDP + \varepsilon$$

Table 5: Regression output table

Variables	Co-efficient	t-statistics	Probability
a	-39082.70	-4.941802	0.0026
FDI(-2)	1.290120	2.013130	0.0908
SFI	1.091539	2.357556	0.0565
DINV	-4.164540	-5.777920	0.0012
dDINV	3.072771	9.640606	0.0001
TPOP	155.2345	2.386608	0.0543
dTPOP	4550.839	1.391724	0.2134
GDP	1.043861	4.886253	0.0027
Adjusted R-squared		0.978771	
F-statistic		86.62561	
Prob(F-statistic)		0.000013	
Durbin-Watson statistic		2.123951	

Analysis of the findings:

Regarding the impact of FDI on growth, two years lagged values of FDI are found to have a positive impact on growth with 90% level of significance. Among others, change in the level of domestic investment has also a strong positive effect on growth. These results are in accordance to the finding of Rothgeb(1984) that FDI flows may have an immediate disruptive effect on third world countries, but that is overcome after a short while, with positive impacts on growth and also domestic efforts to induce growth must be ensured if economic growth is to be achieved.

Conclusion:

This paper evaluates the robustness between inward FDI inflow and various economic indicators and also long term impact of foreign investment in case of Bangladesh. To conclude it can be said that Bangladesh needs to reinforce its infrastructure facilities, improve the quality of its service, liberalize its local and global investment policy further and last but not the least to maintain macroeconomic and political stability to improve its inward FDI performance and potential index and so to become an attractive destination for foreign investors. However, to absorb the positive impact of FDI, it is necessary that the government of Bangladesh strengthen its negotiating capacity on the multilateral stage, in order to protect its own interests by retaining the right to choose the types and direction of FDI according to their own needs. Furthermore, a consistent incentive packages should be implemented in such a way that it will not crowd out domestic investments because domestic investment rate need be increased both to encourage foreign investors and to ensure long term economic growth.

To make our local industries internationally more competitive we must utilize the opportunity to upgrade our technology, gather global managerial skills and practices from the multinational corporations. Only our triumph to do so will ensure sustainable and pro-poor economic growth out of increased foreign investment inflow.

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