

Does FDI promotes sustainable economic growth

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Abstract

The impact of foreign direct investment (FDI) on sustainable economic growth is one of the most extensively researched topics in the field of economics. It has been argued that FDI has positive spill over effect on the host country. However, many studies have agreed that the impact of FDI on economic growth is not same for all the countries and this impact depends upon country specific characteristics. This dissertation examines whether a causal relationship exists between foreign direct investment (FDI) and sustainable economic growth based on annual data for a panel of 24 countries over the period 1981-2013. The paper starts with basic definitions of sustainable economic growth and FDI. Then, review of scientific literatures on this issue has been done. Important indicators that proves the causal relationship between FDI and economic growth has been explained. When host countries have higher level of education, liberalised trade regime and strong financial system, the impact of FDI on its economic growth is high. The sample for the study comprises of 24 countries and its related data has been taken from UNCTAD website. The 24 countries have been divided into five groups: Developed nations, Developing nations: Latin America, Developing nations: East Asia, Other Developing nations and African countries. As a part of empirical analysis, first, the association between FDI and economic growth has been examined for all the groups. Then, Granger causality test has been conducted to assess the causal relationship from FDI to economic growth as well as from economic growth to FDI. The results do not find any correlation between FDI and economic growth in case of Latin America and East Asia during 1981-2000 however the same is present during 2001-2013. The results also confirm the earlier findings that the causal relationship from FDI to economic growth in case of Latin America and East Asia is not conclusive. However, for other developing and developed countries, such causal relationship is present. One interesting

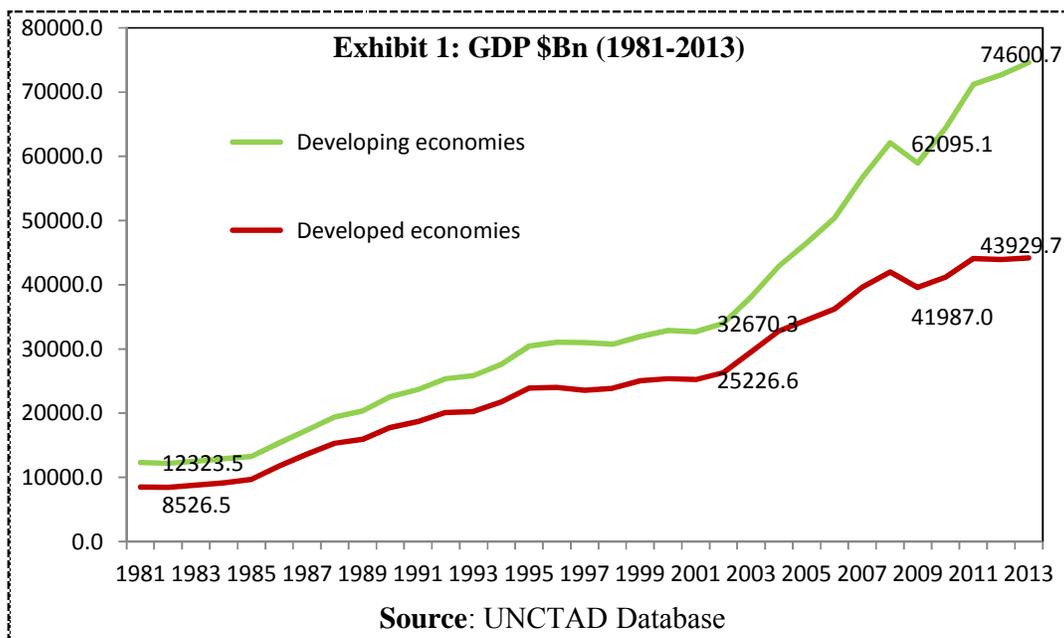
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finding is that FDI combined with exports as a whole does cause economic growth in Latin America and East Asia as well as in other countries. Economic growth to FDI causal relationship is present only in developing countries except East Asia and Latin America.

INTRODUCTION

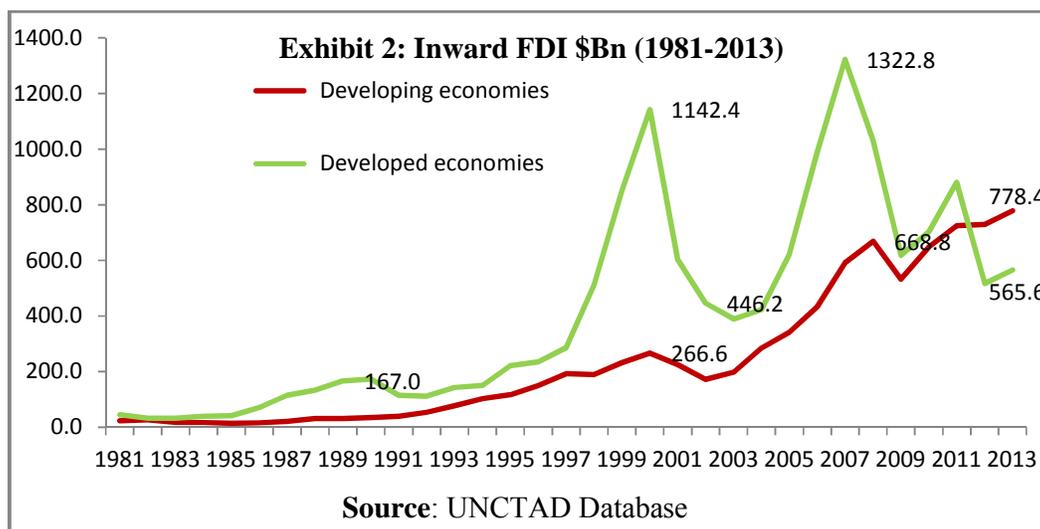
Sustainable economic growth

According to a report published by World commission on Environment and Development in 1987, sustainable economic growth is “Development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. It focuses on maximising current economic and social welfare without depleting the natural resources so that the living standard of future generation is not compromised. Several indicators are available to measure it over a period of time like Gross Domestic product (GDP), Genuine Progress Indicator (GPI), Index of economic welfare (ISEW) and the Measure of economic welfare (MEW) etc. Each of these indicators has its own merits and demerits. Studies like Stockhammer et al (1996) have argued that the most widely used indicator of economic growth GDP does not capture social welfare. However, measuring social welfare is quite a tedious work as multiple factors like pollution; income distribution, environmental danger etc. are more of a qualitative nature. Therefore, most of the economists and statisticians use GDP as a measure of economic growth owing to its simplicity. In this paper, I have used GDP as measure of economic growth. The GDP of developing and developed countries during 1981-2013 is given below:



Foreign Direct Investment

Foreign direct Investment is considered by many to be a major source of capital flows. The parent firm invests capital and thus gains voting rights and control in its foreign affiliate located outside the parent firm’s country. Such types of firms are called multinational enterprises (MNEs) i.e. the firms having entities in different countries. The parent firm is called the direct investor and its foreign affiliate in which the parent firm invests capital is called the direct investment enterprise. There is a long term relationship between the direct investor and direct investment enterprise. FDI includes equity shares, retained earnings and loans given by direct investors to its foreign affiliate. Earlier, Most FDI used to occur between developed countries but in recent years, developing countries are experiencing much higher FDI inflow as evident from Exhibit 2:



A much better measure to gauge the importance of FDI is FDI stock as a percentage of GDP. FDI stock includes net indebtedness of affiliates to the parents as well in addition to the FDI inflows.

	1980		1981-90			1990-00			2000-13		
	FDI Stock	% of GDP	FDI Stock	GDP Growth Rate	% of GDP	FDI Stock	GDP Growth Rate	% of GDP	FDI Stock	GDP Growth Rate	% of GDP
Developing Economies	296	11%	514	51%	13%	1,771	80%	25%	8,483	287%	31%
Developed Economies	402	5%	1,565	111%	9%	5,682	43%	22%	16,053	74%	36%

Source: Computed using data from UNCTAD

As evident from Exhibit 3, in 1981-90, developed countries were growing faster and that is why their FDI stock as a percentage of GDP was less as compared to developing countries. In 2000-13, developing countries were growing at much faster rate leading to FDI Stock as a percentage of GDP being lower for developing countries as compared to developed countries.

In emerging economies, Latin American countries (Argentina, Colombia, and Brazil etc.) & East Asian countries (Hong Kong, Indonesia, and Korea etc.) are the two regions which constitute the major portion of total FDI inflow as shown in Exhibit 4. According to policymakers and economist, the reasons behind putting efforts to attract more FDI is its several positive impacts like access to new markets, transfer of new technologies, improved efficiencies due to increased competition etc. However, the impact of FDI on economic growth is not the same for developed and developing countries. It varies greatly and depends upon the characteristics of the country.

RESEARCH OBJECTIVES

The purpose of this paper is to analyse empirically the impact of FDI on economic growth. The time period for study is 1981-2013. Following are the research objectives:

1. Testing association between FDI and GDP
2. Testing causal relationship from FDI to GDP and from GDP to FDI
3. Identifying factors/indicators that play crucial role in determining the growth of a country due to increased FDI flow.
4. Testing whether the values of these factors different for developed and emerging economies (especially with reference to Latin America and East Asian countries) leading to different impact of FDI on economic growth.

This study aims to contribute to the literature in terms of the study period covered from 1981-2013 which has not been covered by other papers till now.

LITERATURE REVIEW

Balasubramanyam et al. (1996) was one of the first studies which examined the impact of FDI on economic growth. It analysed cross section data of 46 developing countries during 1970-1985 using OLS regression. It states that FDI has positive impact on economic growth only for the export oriented countries. Kentor (1998) analysed the panel data of 79 developed and developing countries during 1938-1990 using OLS regression. According to its result, countries have high dependence on FDI have slow

Exhibit 4: Inward FDI in developing economies(\$ Bn)			
	1981-90	1991-00	2001-13
Developing economies	235.3	1,423.2	6,328.2
Latin America			
Argentina	7.0	76.7	84.4
Colombia	5.1	20.0	105.6
Brazil	16.3	131.0	451.3
Mexico	24.4	101.1	324.0
Total	52.8	328.8	965.3
<i>Share of developing economies(%)</i>	<i>22%</i>	<i>23%</i>	<i>15%</i>
East Asia			
Hong Kong	23.9	157.5	678.5
Indonesia	4.2	16.3	-2.8
Korea	6.3	41.2	125.1
Malaysia	11.3	49.3	81.8
Singapore	23.4	99.7	433.8
Taiwan	5.9	18.2	40.4
Thailand	7.5	32.7	98.3
Total	82.5	414.9	1,455.0
<i>Share of developing economies(%)</i>	<i>35%</i>	<i>29%</i>	<i>23%</i>
Latin America and East Asia combined share of developing economies FDI (%)	58%	52%	38%

Source: Computed using data from UNCTAD

economic growth. Zhang (2001) studied causality between FDI& economic growth using time series data of 11 developing countries in Latin America and East Asia during 1957-1997. It states that, there may not be necessarily a causal relationship between FDI and economic growth of a country. This causal relationship depends on cross country variations. Choe(2003) also analysed causality between FDI & economic growth using time series and panel data of 80 developed and developing countries during 1971-1995. It states that, there is much more evidence of causal relationship from economic growth to FDI rather than from FDI to economic growth. So, we see different results of several studies done till now due to different data samples & methodologies that they have considered.

FACTORS AFFECTING THE CAUSAL RELATIONSHIP BETWEEN FDI AND GROWTH RATE

Development of local financial Market: Empirical analysis has shown that the ability of host countries to take advantage of FDI inflows depends upon the development of local financial market. According to Alfaro et al (2003), the ease with which external financing is available to the potential entrepreneurs and well-functioning financial market ensures that full benefit of long term stable flow will be realised.

Technology diffusion: Imports of high technology equipment, adoption of foreign processes, access to advanced technology leads to technology diffusion in the host country. However, the benefit of technology diffusion will depend on the absorptive capability of host country. Li et al (2004) found that developing countries have low absorptive capability and wide technology gap. As a result, the full benefit of FDI is not realised in these countries. Whereas developed countries have high absorptive capability and thus FDI inflows lead to more economic growth.

Human Capital: Borensztein et al (1998) state that in order to experience the positive impact of FDI, countries must have minimum threshold level of human capital. It is argued that developed countries having educated population are able to realise the benefits of FDI inflows. They also attract more and more FDI as the cost of training is less.

Export oriented Liberalized regime: Studies like Balasubramanyam et al. (1996) have argued that host countries having open economies, liberal policy regimes to capital flows and international trade are more likely to enjoy the benefits of FDI flows.

Political Stability: Political stability also plays a major role in the economic growth as stable government brings positive sentiments in the investor. Stable government brings more FDI into the country leading to the economic growth.

Macroeconomic Environment: The negative macroeconomic environment like high inflation rates, high interest rates discourages FDI inflows and thus limits the scope of economic growth.

DATA

To examine the impact of FDI on economic growth of different countries, all the countries in the world have been divided into five groups as given below. Each group consists of countries receiving majority share of FDI in 2013 in that group.

Exhibit:5 Classification of countries in different groups according to FDI share and geography		
Group 1	Developed countries	US, UK, Canada, Netherland, Ireland and Australia
Group 2	Developing countries- Latin America	Argentina, Brazil, Mexico and Columbia
Group 3	Developing countries- East Asia	Hong Kong, Singapore, Korea and Thailand
Group 4	Developing countries- Others	India, China, Malaysia, Indonesia and Philippines
Group 5	African countries	Benin, Ghana, Kenya, South Africa and Mauritius

Panel data related to FDI inflow, exports, GDP over a period of 1981-2013 for all 24 countries of above five groups have been taken from UNCTAD website.

METHODOLOGY

Methodology for testing association between FDI inflow and GDP

To test the association, the correlation coefficient between FDI and GDP has been calculated for each group within three periods 1981-1990, 1991-2000 and 2001-2013 using the formula:

$$\rho_{\text{FDI, GDP}} = \frac{\text{covariance}(\text{FDI, GDP})}{\sigma_{\text{FDI}} * \sigma_{\text{GDP}}}$$

Where σ_{FDI} and σ_{GDP} is the standard deviation of FDI and GDP respectively

Then for each group and time period, hypothesis test has been conducted at 5% significance level to test whether the correlation between FDI and GDP data is equal to zero. The null and alternative hypothesis is structured as one tailed test as given below:

Exhibit:6 Structuring of Null and Alternate hypothesis statements for correlation test		
Null Hypothesis	Alternate Hypothesis	Decision Criteria
H0: $\rho = 0$ i.e. H0: The correlation between FDI and GDP is zero	Ha: $\rho > 0$ i.e. Ha: The correlation between FDI and GDP is greater than zero	Reject H0 if +t critical < t

For a sample with correlation r and degree of freedom $n-2$ (n =number of samples), the test statistic has been calculated using following equation:

$$t = r \sqrt{(n-2) / \sqrt{1-r^2}}$$

Methodology for testing causality between FDI inflow and GDP

Granger causality method has been used to assess the cause and effect relationship between FDI and GDP. A variable X is called granger cause other variable Y , if the current value of Y can be predicted using past value of X in much better way than the history of Y only. The Granger causality equation is:

$$Y_t = a_1 + \sum_{t=1}^n \beta_i X_{t-i} + \sum_{j=1}^m \gamma_j Y_{t-j} + e_{1t}$$

Testing causality from FDI to GDP

First, for each group, the granger test has been conducted using two variables only i.e. GDP as Y and FDI and X.

$$(GDP)_t = a_1 + \sum_{t=1}^n \beta_i(FDI)_{t-i} + \sum_{j=1}^m \gamma_i(GDP)_{t-j} + e_{1t}$$

Then, along with FDI, other factors like exports etc. have also been introduced in the equations as the independent variables to see the impact on GDP.

$$(GDP)_t = a_1 + \sum_{t=1}^n \beta_i(FDI)_{t-i} + \sum_{j=1}^m \gamma_i(GDP)_{t-j} + \sum_{j=1}^m \delta_i(Exports)_{t-j} + e_{1t}$$

Similar equations can be designed by keeping other factors like human capital, technology gap and stability of market etc. as independent variables.

Testing causality from GDP to FDI

Similarly, for each group, the granger test has been conducted keeping FDI as Y and GDP and X.

$$(FDI)_t = a_1 + \sum_{t=1}^n \beta_i(GDP)_{t-i} + \sum_{j=1}^m \gamma_i(FDI)_{t-j} + e_{1t}$$

STATA has been used to run the Granger causality test.

Hypothesis Testing

For each group, chi squared hypothesis test has been conducted at 5% significance level to test causality from FDI to GDP and from GDP to FDI. The null and alternative hypothesis is structured as given below:

Exhibit:7 Structuring of Null and Alternate hypothesis statements for causality test				
Causality direction	Case	Null Hypothesis	Alternate Hypothesis	Decision Criteria
FDI to GDP	1	H ₀ : lagged FDI does not cause GDP growth	H _a : lagged FDI does cause GDP growth	If Probability > 5%, Accept Null hypothesis otherwise reject Null hypothesis
	2	H ₀ : lagged FDI & Exports combined does not cause GDP growth	H _a : lagged FDI & Exports combined does cause GDP growth	
GDP to FDI	1	H ₀ : lagged GDP does not cause FDI growth	H _a : lagged GDP does cause FDI growth	

EMPIRICAL ANALYSIS

Association between FDI inflow and GDP

As expected, For Group 2 and Group 3 i.e. Latin America and East Asia, the correlation between FDI and GDP during 1981-1990 and 1991-2000 is not established at 5% significance level. However, for the same region, FDI and GDP are correlated in 2001-2013 at 5% significance level.

Exhibit 8: Correlation between FDI and GDP at 5% significance level

	1981-1990				1991-2000				2001-2013			
	Correlation	t-stat	t-critical	Result	Correlation	t-stat	t-critical	Result	Correlation	t-stat	t-critical	Result
Group 1	0.95	5.8	2.1	Reject H ₀	0.92	4.7	2.1	Reject H ₀	0.57	1.4	2.1	Accept H ₀
Group 2	0.62	1.1	2.9	Accept H ₀	0.79	1.8	2.9	Accept H ₀	0.93	3.6	2.9	Reject H ₀
Group 3	0.87	2.5	2.9	Accept H ₀	0.50	0.8	2.9	Accept H ₀	0.96	4.8	2.9	Reject H ₀
Group 4	0.84	2.7	2.4	Reject H ₀	0.15	0.3	2.4	Accept H ₀	0.89	3.4	2.4	Reject

												HO
Group 5	0.19	0.3	2.4	Accept HO	0.69	1.7	2.4	Accept HO	0.62	1.4	2.4	Accept HO

Similarly, for group 5 i.e. African countries, FDI and GDP are not correlated during entire period i.e. 1981-2013 at 5% significance level. For the developed countries (Group 1), the two variables are correlated during 1981-1990 and 1991-2000 but not during 2001-2013. For other developing countries (Group 4), the two variables are correlated during 1981-1990 and 2001-2013 but not during 1991-2000.

Causality between FDI inflow and GDP

Causality from FDI to GDP

The result of the Granger test for causality from FDI to GDP is given in Exhibit 6. If we consider FDI alone, its causal relationship with GDP is rejected for Group 2 and 3 i.e. for Latin America and East Asia. It is in same line as with the earlier studies on FDI-GDP causal relationship for these two regions. However, the interesting finding is, if we combine FDI with exports then they together as a whole are able to cause GDP growth in both Latin America and East Asia. For other regions, the causation between FDI & GDP is established. Similarly, the causation between FDI with Exports as a whole & GDP growth is established.

Exhibit 9: Granger test for causality from FDI to GDP (1981-2013) at 5% Significance level

Groups	FDI on GDP			FDI & Exports on GDP		
	Probability	Null Hypothesis	Causation	Probability	Null Hypothesis	Causation
Group 1	0.1%	Reject	Yes	0.1%	Reject	Yes
Group 2	10.5%	Accept	No	0.1%	Reject	Yes
Group 3	11.4%	Accept	No	1.0%	Reject	Yes
Group 4	0.1%	Reject	Yes	0.1%	Reject	Yes
Group 5	0.1%	Reject	Yes	0.1%	Reject	Yes

Causality from GDP to FDI

The result of the Granger test for causality from GDP to FDI is given in Exhibit 7. Only for group 4 i.e. developing countries apart from East Asia and Latin America, GDP causes more and more FDI. Such causation is not present in other countries.

Exhibit 10: Granger test for causality from GDP to FDI (1981-2013) at 5% Significance level

Groups	GDP on FDI		
	Probability	Null Hypothesis	Causation
Group 1	14.0%	Accept	No
Group 2	19.8%	Accept	No
Group 3	9.2%	Accept	No
Group 4	0.1%	Reject	Yes
Group 5	15.0%	Accept	No

CONCLUSION

The purpose of this study was to assess the correlation and causality between FDI and economic growth in developing and developed countries during 1981-2013. The major finding that emerges from the study is that the impact of FDI on economic growth and thus

causal relationship between FDI and economic growth is different for different countries. The variation is due to huge diversity in the economic structures of different nations. The technology absorptive capabilities, human capital and trade regimes are some of the indicators that determine the causal relationship. In Latin America and East Asia, the causality from FDI to economic growth is not present due to high technology gap, low human capital etc. whereas in the developed and other developing economies, causality is present. The causal relationship from economic growth to FDI is only present in developing countries except East Asia and Latin America. For other countries, this causality is not present.

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