A STUDY ON FDI AND ECONOMIC GROWTH IN SELECTED ASSOCIATIONS: EVIDENCE FROM GRANGER CAUSALITY TEST

Prof. Mitesh Patel[1]
Prof. Ritesh Patel[2]

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ABSTRACT

The study was carrying out to find a relation between FDI and economic growth in various associations by having evidence from granger causality test. Study was done by using data on GDP & FDI from year 1970 to till 2008.Various analytical tools such as descriptive statistics, correlation among GDP & FDI of various associations, ADF test & granger causality test was applied to find that is there is any granger cause or not. The study gives result that there is somewhat positive & somewhat negative correlation among GDP & FDI of various associations. ADF test was applied to test whether data is stationary or not. Moreover, FTAA & APTA member nations, found FDI's granger cause to GDP where as both ASEAN & NAFTA member nations, FDI can granger cause to GDP & GDP can granger cause to FDI.

KEYWORDS: FDI, GDP, Granger causality

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INTRODUCTION

[3]Foreign direct investment (FDI) is any form of investment that earns interest in enterprises which function outside of the domestic territory of the investor. FDI require a business relationship between a parent company and its foreign subsidiary. Foreign direct business relationships give rise to multinational corporations. For an investment to be regarded as a FDI, the parent firm needs to have at least 10% of the ordinary shares of its foreign affiliates. The investing firm may also qualify for an FDI if it owns voting power in a business enterprise operating in a foreign country. FDIs can be broadly classified into two types: outward FDIs and inward FDIs. This classification is based on the types of restrictions imposed, and the various prerequisites required for these investments. An outward-bound FDI is backed by the government against all types of associated risks. Inward FDIs is encouraged by various economic factors such as interest loans, tax breaks, grants, subsidies and removal of restrictions and limitations. Factors detrimental to the growth of FDIs include necessities of differential performance and limitations related with ownership patterns.

About Some Selected Associations

[4]CEMAC has objective to promote the establishment of a Central African Common Market. Member nations of CEMAC are Cameroon, Central African Republic, Chad, and Republic of the Congo, Equatorial Guinea and Gabon. COMESA is a Common Market for Eastern and Southern Africa whose member nations are Burundi, Comoros, D.R. Congo, Djibouti, Egypt Eritrea, Ethiopia, Kenya, Libya, Madagascar, Malawi, Mauritius, Rwanda, Seychelles, Sudan Swaziland, Uganda. [5]ECOWAS is the economic community of West African States is a regional group of fifteen countries, founded in 1975. [6]SADC is started as frontline states

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[1] Assistant Professor, S.V.Institute of Management, Kadi, Gujarat Technological University, Gujarat, India. E-mail:patel4mitesh@gmail.com
[2] Assistant Professor, S.V.Institute of Management, Kadi, Gujarat Technological University, Gujarat, India. E-mail:prof.ritesh2010@gmail.com
[3] http://www.economywatch.com/foreign-direct-investment
[4] http://www.iccnow.org/?mod=cemac
[5] http://www.ecowas.int/?lang=en
[6] http://www.sadc.int/index/browse/page/715

with objective of political liberation of Southern Africa. [7]ECCAS was set up with objectives to develop capacities to maintain peace, security and stability. [8]FTAA began with the summit of the Americas in Miami on December 11, 1994. Member nations are Antigua, Barbuda, Argentina, Bahamas, Barbados, Guatemala, Guyana,   Haiti,   Honduras, Jamaica, Mexico, Panama, Paraguay, Peru, Saint Kitts and Nevis, Saint Lucia, Trinidad and Tobago, U S, Uruguay. LAIA is based in Montevideo association. Its main objective is establishment of a common market, in pursuit of the economic and social development of the region. [9]NAFTA is an agreement signed by the governments of Canada, Mexico and the United States, creating a trilateral trade bloc in North America. [10]Marcosur is a Regional Trade Agreement (RTA) between Argentina, Brazil, Paraguay and Uruguay founded in 1991 by the Treaty of Asunción, which was later amended and updated by the 1994 Treaty of Ouro Preto. [11]APTA is the oldest preferential trade agreement between developing countries in the Asia-Pacific region. Member Nations of APTA are Bangladesh, China, India, and Republic of Korea & Lao People's Democratic Republic etc. [12]ASEAN is a geo-political and economic organization of 10 countries located in Southeast Asia, which was formed on 8 August 1967 by Indonesia, Malaysia, Philippines, Singapore and Thailand. [13]ECO is an intergovernmental regional organization established in 1985 by Iran, Pakistan and Turkey. Current Members of ECO are Islamic state of Afghanistan, Azerbaijan Republic, Islamic Republic of Iran, Kyrgyz Republic, Islamic Republic of Pakistan, Republic of Tajikistan, Republic of Turkey, Turkmenistan and Republic of Uzbekistan. [14]EFTA was established on 3 May 1960 as a trade bloc-alternative for European states. Today, only Iceland, Norway, Switzerland, and Liechtenstein are members of EFTA. [15]EU is an economic and political union of 27 member states which are located primarily in Europe. [16] SAARC is an organization of South Asian nations, founded in 1985. Member nations are Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal & Pakistan. [17]G20 is a forum, created by France in 1975, for governments of six countries in the world namely France, Germany, Italy, Japan, the United Kingdom, and the United States.

REVIEW OF LITERATURE

Impact of Foreign Direct Investment on Indian economy: A sectoral level analysis was prepared by Dr Maathai K. Mathiyazhagan. The main objective of this paper is to examine the long-run relationship of Foreign Direct Investment (FDI) with the Gross Output (GO), Export (EX) and Labour Productivity (LPR) in the Indian economy at the sectorial level by using the annual data from 1990-91 to 2000-01. Results also reveal that there is no significant co-integrating relationship among the variables like FDI, GO, EX and LPR in core sectors of the economy. This implies that when there is an increase in the output, export or labor productivity of the sectors it is not due to the advent of FDI. A Paper on "Impact of Foreign

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[7] http://www.africa-union.org/root/au/recs/eccas.htm

[8] http://en.wikipedia.org/wiki/Free_Trade_Area_of_the_Americas

[9] http://en.wikipedia.org/wiki/North_American_Free_Trade_Agreement

[10] http://en.wikipedia.org/wiki/Mercosur

[11] http://en.wikipedia.org/wiki/apta

[12] http://en.wikipedia.org/wiki/asean

[13] http://en.wikipedia.org/wiki/Eco

[14] http://en.wikipedia.org/wiki/European_Free_Trade_Association

[15] http://en.wikipedia.org/wiki/European_Union

[16]http://en.wikipedia.org/wiki/South_Asian_Association_for_Regional_Cooperation

[17] http://en.wikipedia.org/wiki/G20

Direct Investment on economic growth in Pakistan" was prepared by Nuzhat Falki. The paper says that Foreign Direct Investment (FDI) is often seen as an important catalyst for economic growth in the developing countries. The main purpose of the study is to investigate the impact of FDI on economic growth in Pakistan, for the period 1980-2006. The relationship between FDI and economic growth is analyzed by using the production function based on the endogenous growth theory; other variables that affect economic growth such as trade, domestic capital and, labors are also used. The results of the study show a negative and statistically insignificant relation between the GDP and FDI inflows in Pakistan. A research paper on title, "The economics of Foreign Direct Investment incentives", was prepared by Magnus Blomström & Ari Kokko. This paper suggests that the use of investment incentives focusing exclusively on foreign firms, although motivated in some cases from a theoretical point of view, is generally not an efficient way to raise national welfare. The potential spillover benefits are realized only if local firms have the ability and motivation to invest in absorbing foreign technologies and skills. A study on," Foreign Direct Investment in Pakistan: Policy issues and operational implications", was prepared by Ashfaque H. Khan and Yun-Hwan Kim. Foreign direct investment is now perceived in many developing countries as a key source of much needed capital, foreign advanced technology and managerial skills. Realizing its central importance to economic development, these developing countries have taken wide-ranging steps to liberalize their inward FDI regime and have succeeded in attracting substantial amount of FDI. Within a span of seven years (1990-1997), the inflow of FDI rose from $34 billion to $150 billion, accounting for 37% of world FDI. P.P.A Wasantha Athukorala was carried out a research work of the Impact of foreign direct investment for economic growth: a case study in Sri Lanka. The integration of developing countries with the global economy increased sharply in the 1990s with changing in their economic policies and lowering of barriers to trade and investment. FDI is assumed to benefit a poor country like Sri Lanka, not only by supplementing domestic investment, but also in terms of employment creation, transfer of technology, increased domestic competition and other positive externalities. As a result, during the last decade FDI inflows in Sri Lanka has increased considerably by 8.5 in 1990 to 15.0 in 2000 as a percentage of GDP while Indian experience was 0.5 to 4.1 in the same period however, previous literature suggests that the FDI inflows have a positive impact on economic growth of host countries. Impact of foreign direct investment on the economy of Slovakia was prepared by adela Hošková. Analyses of international competitiveness of individual countries are based on their ability to sustain economic growth over a long term. This above all involves the growth of production (GDP), productivity of labor and the translation of these positive developments into multiplication effects domestically and also in external economic relations. As was shown by the results of our analyses, when it comes to the entry and operation of FDI in Slovakia, all these have in principle been accomplished: a high rate of growth of labor productivity, and that developing at a higher pace than in the case of comparable local partners, internationally reaching the standard of parent organizations, a growing volume of output of adequate quality and maintained employment.

RESEARCH METHODOLOGY

The study was an exploratory research- cause and effect relationship research, between FDI & GDP in various associations. Research was carried out by using annual data from year 1970 to 2008 for factors like FDI (foreign direct investment) & gross domestic product of selected associations. Various analytical tools such as correlation, unit root test (ADF test) and granger causality test were applied in study. The study is done on various associations

namely, CEMAC, COMESA, ECCAS, SADC, FTAA, LAIA, MERCOSUR, NAFTA, APTA, ASEAN, ECO, SAARC, EFTA, EU & G20. The main objective of this study is gross better understanding of the integration of foreign direct investment (FDI) and domestic product (GDP) of selected associations. The secondary objective is to find out the causal relationship, if any, between foreign direct investments (FDI) and Gross Domestic product (GDP).

DATA ANALYSIS AND INTERPRETATION

1. Descriptive statistics

Table 1 Descriptive statistics of GDP & FDI of selected associations

Association	Factor	Mean	Standard deviation	Skeness	Kurtosis	Jarque–bera
CEMAC	FDI	6060.94	8912.78	2.29	1.76	34.86
	GDP	3.11	6.63	5.74	-2.68	215.95
COMESA	FDI	25389	32327.29	2.27	2.48	35.03
	GDP	4.83	1.65	0.42	-1.11	1.45
ECCAS	FDI	12409.8	18370.57	2.27	2.36	34.88
	GDP	3.92	6.17	4.06	0.94	107.36
SADC	FDI	40195.3	50746.41	1.89	0.34	23.24
	GDP	3.8	1.62	0.21	-0.81	0.94
FTAA	FDI	1048858	1195344.3	1.26	0.68	10.43
	GDP	3.23	1.19	0.39	2.41	2.44
LAIA	FDI	235733	291211.1	1.39	1.08	12.85
	GDP	3.61	2.65	1.78	2.31	21.92
MERCOSUR	FDI	100335	118362.67	1.39	1.28	12.96
	GDP	3.88	4.28	2.59	2.64	45.34
NAFTA	FDI	856869	968127.85	1.23	0.54	9.9
	GDP	3.12	1.14	0.28	-0.05	0.51
APTA	FDI	154893	213328.34	1.39	1.02	12.81
	GDP	7.79	2.89	3.84	1.15	96.17
ASEAN	FDI	153723	192300.78	1.54	1.91	16.32
	GDP	4.9	4.15	0.81	0.92	4.47
	FDI	43965.5	69784.12	2.44	2.65	40.45

ECO	GDP	4.42	3.74	2.15	2.25	53.69
	FDI	25454.9	46974.26	2.84	2.37	53.83
SAARC	GDP	6.58	2.15	1.12	1.85	9
	FDI	94096.2	136578.14	2.06	2.86	29.62
EFTA	GDP	2.81	2.79	4.45	2.68	130.51
	FDI	1537665	2071693.11	1.68	2.03	19.37
EU	GDP	2.71	2.24	4.54	2.3	135.29
G 20	FDI	153723	143965.49	2.47	4.1	32.24
	GDP	0.92	4.47	4	3.2	983.47

A normal distribution has mean value of 1. Here in case of all the associations the mean value of GDP and FDI flow is not equal to 1, which further reveals that the data are not normally distributed. A normal distribution has standard deviation value of 0. Here in case of all the associations the standard deviation value of GDP and FDI flow is not equal to 0, which further reveals that the data are not normally distributed. Skew is a measure of symmetry. Here, in test, it was found that skeness of distribution is a greater than 0.00. A normal distribution has skew=0. So it can be said that our distribution is not symmetric. Kurtosis is a measure of peakeness and the fat-tails that associate with less density in the middle; a normal distribution has kurtosis = 3.0 or excess. Here kurtosis is less than 3.00. So it can be said that our distribution is not symmetric. From the mean score, standard deviation kurtosis and skewness it can be revealed that the data of GDP and FDI of all selected associations are not normally distributed so further test can applied.

2. Correlation Analysis

Table 2 Correlation between FDI & GDP in selected associations

Association	Correlation between FDI & GDP in association	Association	Correlation between FDI & GDP in association
CEMAC	0.036	Marcosur	0.0809
COMESA	0.387	NAFTA	-0.292
ECCAS	0.233	APTA	0.109
SADC	0.33	ASEAN	0.075
FTAA	-0.19	ECO	0.145331
G20	-0.0286	SAARC	0.203575
LAIA	0.107	EFTA	-0.0055
		EU	-0.0759

There is a normal correlation of 0.036045 between CEMAC FDI & CEMAC GDP; which means that FDI flow in CEMAC has somewhat impact on GDP growth rate in CEMAC member nations over a period of time. During a period of 1970 to 2008, there was somewhat positive correlation of 0.387529 between COMESA FDI & COMESA GDP, which further enhances that the flow of FDI in COMESA has somewhat positive impact on GDP of member nations of COMESA. There is somewhat positive correlation of 0.233505 Between ECCAS GDP & ECCAS GDP; which shows that the flow of FDI in ECCAS nations has somewhat positive impact on GDP of these nations. The correlation between SADC GDP & SADC FDI was somewhat positive with value of 0.330457 over a period of time. It further reveals that during 1970-2008, the flow of FDI in member nations of SADC has somewhat positive impact on GDP of member nations of SADC.

The correlation between FTAA GDP & FTAA FDI is somewhat negative with value of -0.1990 which further enhances that Flow of FDI in FTAA nations has somewhat negative relation with GDP of member nations of FTAA. The correlation between LAIA GDP & LAIA FDI is somewhat positive at 0.10727; which reveals that the FDI flow in member nations of LAIA. The correlation between MERCOSUR GDP & MERCOSUR FDI is somewhat positive at 0.080979. The FDI flow in MERCOSUR Member nation has somewhat positive impact on GDP of member nations of MERCOSUR. Moreover, the correlation between NAFTA GDP & NAFTA FDI is somewhat negative at -0.29277; which further enhances that flow of FDI in NAFTA nations has negative impact on GDP of member nations. The correlation between APTA GDP & APTA FDI is somewhat positive at 0.109664, which shows that flow of FDI has somewhat positive impact on GDP rate of such nations.

There is somewhat positive correlation between ASEAN GDP & ASEAN FDI of 0.07546, which further enhances that the floe of FDI has somewhat positive impact on GDP growth rate of member nations of ASEAN. The correlation between ECO GDP & ECO FDI is somewhat positive at 0.145331; which reveals that the flow of FDI in member nations of ECO has somewhat influence on GDP growth rate of member nations of ECO. Over a period of 1970-2008, the correlation between SAARC GDP & SAARC FDI is somewhat positive at 0.203575; which further reveals that FDI Flow in SAARC has somewhat positive influence on GDP of member nations. The correlation between EFTA GDP & EFTA FDI is somewhat negative at -0.0055; which shows that FDI has somewhat negative impact on GDP of EFTA member nations. The correlation between EU GDP & EU FDI is somewhat negative at -0.0759, which reveals that FDI has somewhat negative impact on GDP of EU member nations. The correlation between G20 GDP & G20 FDI is somewhat negative at -0.0286, which shows that the flow of FDI in G 20 member nations has somewhat negative impact on GDP growth rate of G 20 nations.

3. Empirical Analysis

Table 3 Unit root test of FDI & GDP of selected associations

Association	Factor	ADF Test Value	Association	Factor	ADF Test Value
CEMAC	FDI	1.086	NAFTA	FDI	-3.774
	GDP	2.059		GDP	-4.38
COMESA	FDI	-5.945	APTA	FDI	-3.633
	GDP	-3.64		GDP	-6.706
ECCAS	FDI	-4.127	ASEAN	FDI	-4.678
	GDP	-4.534		GDP	-4.547
ECOWAS	FDI	-3.7	ECO	FDI	2.305
	GDP	-6.744		GDP	-7.012
SADC	FDI	-3.758	SAARC	FDI	11.967
	GDP	-3.758		GDP	-3.483
FTAA	FDI	-3.837	EFTA	FDI	0.629
	GDP	-4.527		GDP	-4.341
LAIA	FDI	-6.137	EU	FDI	7.027
	GDP	-4.382		GDP	-4.892
Marcosur	FDI	-3.58	G20	FDI	2.777
	GDP	-3.375		GDP	-4.609

Null Hypothesis: Sample is unit root.
Alternative hypothesis: Sample is not unit root.
For FDI flow, the sample is not normally distributed for COMESA, ECCAS, ECOWAS, FTAA, LAIA, MERCOSUR, NAFTA, APTA, ASEAN, ECO, SAARC, EFTA, EU and G20 & further test can be applied on FDI flow. For GDP growth rate, the sample is not normally distributed for COMESA, ECCAS, ECOWAS,FTAA, SADC, LAIA, MERCOSUR, APTA and ASEAN & further test can be done on GDP growth rate. Here now Granger causality test will be applied. ADF test has been conducted on all the variables to check their stationary in order to fulfill the precondition of Granger causality, all the variables are found stationary,

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[18]@ 5% Significance Level

i.e., their error term us is white noise and the hypothesis that coefficient δ=0 is rejected as the computed absolute value of tau statistic is greater than the DF.

4. Granger Causality Test

Table 4 Granger Bivariate F- test for causality

Association	Null Hypotheses	Granger F-Test Value[19]	Remarks
COMESA	FDI does not Granger Cause GDP	0.6941	Independent
	GDP does not Granger Cause FDI	1.714	Independent
ECCAS	FDI does not Granger Cause GDP	0.00585	Independent
	GDP does not Granger Cause FDI	1.089	Independent
SADC	FDI does not Granger Cause GDP	0.1137	Independent
	GDP does not Granger Cause FDI	1.481	Independent
FTAA	FDI does not Granger Cause GDP	2.191	FDI ⟶ GDP
	GDP does not Granger Cause FDI	1.653	Independent
LAIA	FDI does not Granger Cause GDP	0.541	Independent
	GDP does not Granger Cause FDI	0.2301	Independent
NAFTA	FDI does not Granger Cause GDP	3.667	FDI ⟶ GDP
	GDP does not Granger Cause FDI	3.503	GDP ⟵ FDI
APTA	FDI does not Granger Cause GDP	5.1045	FDI ⟶ GDP
	GDP does not Granger Cause FDI	0.306	Independent
ASEAN	FDI does not Granger Cause GDP	3.667	FDI ⟶ GDP
	GDP does not Granger Cause FDI	3.503	GDP ⟵ FDI

Granger causality is a statistical concept of causality that is based on prediction. According to granger causality, if a signal X_1 "Granger-causes" (or "G-causes") a signal X_2, then past values of X_1 should contain information that helps predict X_2 above and beyond the information contained in past values of X_2 alone. Its mathematical formulation is based on linear regression modeling of stochastic processes (Granger 1969). More complex extensions to nonlinear cases exist, however these extensions are often more difficult to apply in practice. In COMESA granger test value is 0.6941, which enhances that the null hypotheses should be accepted & FDI does not granger cause to GDP where as the granger test value is 1.714 which enhances that the null hypotheses should be accepted & GDP does not granger cause FDI.

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[19] @5% Significant Level

For ECCAS member nations, granger test value is 0.00585, which enhances that the null hypotheses should be accepted & FDI does not granger cause to GDP where as the granger test value is 1.089 which enhances that the null hypotheses should be accepted & GDP does not granger cause FDI. For SADC member nations, granger test value is 0.1137, which enhances that the null hypotheses should be accepted & FDI does not granger cause to GDP where as the granger test value is 1.481 which enhances that the null hypotheses should be accepted & GDP does not granger cause FDI. In FTAA, granger test value is 2.191, which enhances that the null hypotheses should not be accepted & FDI does granger cause to GDP where as the granger test value is 1.653 which enhances that the null hypotheses should be accepted & GDP does not granger cause FDI.

In LAIA member nations, granger test value is 0.541, which enhances that the null hypotheses should be accepted & FDI does not granger cause to GDP where as the   granger test value is 0.2301 which enhances that the null hypotheses should be accepted & GDP does not granger cause FDI. Again for the NAFTA member nations, granger test value is 3.667, which enhances that the null hypotheses not should be accepted & FDI does granger cause to GDP where as the granger test value is 3.503 which enhance that the null hypotheses should not be accepted & GDP does granger cause FDI. For APTA member nations, granger test value is 5.1045, which enhances that the null hypotheses not should be accepted & FDI does granger cause to GDP where as the   granger test value is 0.30 which enhance that the null hypotheses should be accepted & GDP does not granger cause FDI.

CONCLUSION

From descriptive statistics it is found that the samples are not a normally distributed population which reflects that further test can be applied on this data of FDI Flow & GDP. There is a normal correlation between CEMAC FDI & CEMAC GDP; COMESA FDI & COMESA GDP & there is somewhat positive correlation between ECCAS GDP & ECCAS FDI; SADC GDP & SADC, FTAA GDP & FTAA FDI, LAIA GDP & LAIA FDI, MERCOSUR GDP & MERCOSUR FDI. The correlation between NAFTA GDP & NAFTA FDI is somewhat negative. ADF test has been conducted on all the variables to check their stationary in order to fulfill the precondition of Granger causality. As per ADF test, for GDP growth rate the sample is not normally distributed in case of COMESA, ECCAS, ECOWAS, FTAA, SADC, LAIA, MERCOSUR, APTA and ASEAN & further test can be done on GDP growth rate. In case of FTAA member nations the FDI can granger cause to GDP. In NAFTA member nations, the FDI can granger cause to GDP & GDP can granger cause to FDI. For APTA member nations FDI does granger cause to GDP. For the member nations of ASEAN the FDI can granger cause to GDP & GDP can granger cause to FDI. For member nations of COMESA, ECCAS, SADC & LAIA relationship between FDI & GDP is Independent.

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