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Determinants of Global Direct Investment in BRICS Economies

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Abstract – Development of any economy or organization is depends on the availability of resources and mainly based upon financial resources. BRICS countries are the fast-developing economies in the world. BRICS as combined, account for more than a quarter of the world's land area, 40% of the world's population, and have a combined GDP (PPP) of US$ 20.39 trillion in 2011.

This paper has tried to attempt an analysis of the possible determinants of Global Direct Investment in BRICS nations. This paper has divided in two part. First part deals with introduction, objective and methodology and second part explain the analysis and explanations and conclusion.

Key Words: BRICS, Economy, Export, GDI, Growth, Productivity

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INTRODUCTION

Due to Globalization and liberalization in the trade policy all the countries are coming together and they are investing in other countries in the form of foreign direct Investment, Foreign Portfolio Investment, foreign Institutional Investors and many different forms. In developing countries there has been remarkable shift in attitude towards attracting FDI .Capital flows in these countries from developed countries have become important source for the growth of the economy .More capital inflow will lead to more job creation in the country which will increase the employment rate in the country which in turn will increase the per-capita income of the country and this will lead to economic growth of the country.

FDI has played a significant role in the growth and development of world economy particularly in developing countries like all the BRICS nation because it links the host economy with globalized markets and foster's economic growth (suvranshu pan, 2007).FDI is playing a supportive role to most of the recipients and host countries whether it is advanced, developing or a poor country. Capital flows in the form of FDI have been widely believed to be an important source of growth in recent years (suvranshu pan, 2007) .In the earlier approaches , the impact of FDI on growth was found to be limited in the short-run since long-run growth was largely considered to be contingent upon technological process (Helpman, 1991) .

Empirical investigation have found that the positive impact of FDI is generally higher for recipient countries with higher level of development .Such findings shows that FDI has positive impact on the economic growth of the country (suvranshu pan, 2007).All the markets in open economy are closely related to each other, so change in any market activities will influence the activities of other activities. So, change in trade activities will influence the economic growth of the country. To find out the relationship between financial markets and goods market, national income in terms of savings and investment as

$$\mathbf{Y = C + I + G + (X - M)}$$

Where Y= national income,

C= national consumption,

I= national investment,

G=Government expenditure

(X-M) = net exports.

Therefore, S – I = (X – M) means an economy's net exports must always equal the difference between savings and investment. Difference between national savings and national investment is known as Net Foreign investments. Net Foreign Investment and national income have direct relationship means increase in Net FDI will increase national income and vice-versa .Increase in exports will increase the inflow of money supply which in turn will increase the GDP of the country that will have positive impact on the economic growth. National Income account shows that net FDI always equals trade balance (suvranshu pan, 2007) . There may be several

factors impacting the economic growth but this objective focuses mainly on the impact of export, import and Foreign Direct Investment on the economic growth.

LITERATURE REVIEW

Jayachandran and Seilan (2014) investigated the relationship between trade, Foreign Direct Investment (FDI) and economic growth of India over the period 1970-2007. The results of Granger causality test shows that there is a causal relationship between the examined variables. The direction of causality relationship is from FDIs to growth rate and there is no causality relationship from growth rates to FDIs. Most of empirical studies carried out in the past used multi regression model to study the impact of flow of FDI & FII.**Sharma and Nishant (2014)** paper attempts to examine the association between inflow of foreign direct investment and gross domestic product of BRICS countries viz., Brazil, Russia, India, China and South Africa for a period of 20 years from 1993 to 2012. Granger casualty test confirmed the results of co-integration and found that in Russia neither GDP Granger cause FDI nor FDI Granger cause GDP. For rest four nations unidirectional relationship was observed. In India and China GDP granger caused FDI whereas in Brazil and South Africa FDI Granger cause GDP.**Ayyanar and Jayachandra (2014**) paper provides an overview of FDI inflows and Trade in India and China. It shows that FDI and Trade is the fastest growing in India and China, contributing significantly to GDP, GDP growth, employment, trade and investment. In the result of regression co efficient of simple linear and semi log linear model implies that India and China had a possibility for positive relationship on Foreign Direct Investment and it plays a significant role in enhancing the level of economic growth. Import performance of China shows that regression co efficient in both the models are insignificant, so China had negative impact on their Import performance. Export performance of India shows the regression co efficient on both the models are insignificant. There is also a negative impact on India's Export performance. **Sharma& Kaur (2013)** paper examines the causal relationships between FDI and trade(Exports and Imports) in India and China. Granger causality test has been employed to examine the causal relation between FDI and trade by using the data over the period of 1976-2011.The results for China show unidirectional causality running from FDI to imports and FDI to exports, however, there exist bidirectional causality between imports and exports. India gives the results which are not similar to China where bidirectional causality between FDI and imports; FDI and exports; and exports and imports have been found.**Zafar Ahmad Sultan (2013)** examines the nature of relationship between export and FDI in India over the period 1980-2010.Using Johansen co-integration method, the paper finds a stable long run equilibrium relationship between FDI and export growth. The result of Granger causality based on vector error correction model (VECM) shows that causality runs from export to FDI inflow direction and not from FDI inflow to export direction. In the short run, however, neither export Granger cause FDI inflow nor FDI inflow Granger cause export from India.**Ling Foo Sien (2013)**examine empirically FDI and economic growth in the Brazil ,Russia, India, and China (BRIC) countries. By using annual time series data for the period 1980 to 2011, empirical analysis shows that FDI plays unambiguous role in contributing to economic growth in BRIC countries using VECM and Granger Causality on VECM method .

METHODOLOGY

Data sources - This study is based on the secondary data**.** The Data has been collected from various sources. Export, import, FDI and GDP of Brazil is collected from Central Bank of Brazil. China data is collected from National Bureau of Statistics of China. Russia data is collected from Central Bank of Russian Federation. India data is collected from Reserve bank of India and MOSPI. South Africa data is collected from South African Reserve Bank.

Period of the Study . Data is analyzed using quarterly data for the period of 2000-2015.

Variables of the study: Variables used in this objective is FDI, GDP, Import and Export of all BRICS nation**.**

Statistical Techniques. Statistical tools used in this objective are Unit Root Test, Cointegration, VECM and Granger Causality.

ANALYSIS AND INTERPRETATION

Unit Root Test

Empirical Results - Global foreign direct investment (FDI) inflows fell by 16per cent in 2014 to $1.23 trillion, down from $1.47 trillion in 2013 (UNCTAD, 2015). FDI flows to *developed countries* dropped by 28 percent to $499 billion (UNCTAD, 2015).As per the UNCTAD Investment Report, 2015 , China become the largest recipient of FDI inflow in 2014. The graph in figure 1 shows that inflow of FDI in China is highest as compared to other BRICS economies . Inflow of FDI to other BRICS countries are also improving from the previous period . Inflow of FDI and increase in export will positively impact the economic growth whereas increase in import will have negative impact on the economic growth . There is almost 145% increase in the inflow of FDI in Brazil , Russia FDI inflow increase is about 77% but as a % of GDP increase in Brazil FDI inflow is about 272% , Russia it is 120% , India increase is about 133% , although there is sharp increase in the inflow of FDI in China but there is almost 36% decline in the inflow of FDI as a % of GDP. As per the UNCTAD Investment Report , 2015 among BRICS , China is

the 2nd largest recipient for FDI in world , Brazil ranks as 7th largest recipient , India as 15th rank and Russian Federation as 15th rank in 2013 . GDP is used as a proxy to measure the economic growth. It measures the economy total production in goods and services. It is the total income generation and spending of the government in the domestic boundary. Exports of goods and services will lead to income generation for the country .Thus it will have positive impact on the economic growth. Imports on other hand will lead to income generation for the foreign countries .So it will create negative impact on the economic growth .Increase in exports and FDI and decline in imports will increase the GDP which will and there will be more economic growth .The econometrics model used to know the causal relationship among exports, imports, FDI and GDP can be assessed by using granger causality test. Before going for the granger causality, stationarity of data will be checked by using Unit Root Test. To check the stationarity ADF (Augmented Dickey Fuller) Test and PP-test (Phillip's – Parron) test is used. The ADF test includes the extra lagged terms of the dependent variables in order to eliminate autocorrelation (Sridhar an 2009). The ADF test statistic has the same asymptotic distribution as the Dickey Fuller (DF) statistic, so same critical values can be used. (Meerza)

From the result of 1, it can be shown that we accept null hypothesis for all the variables in ADF test except for South Africa FDI inflow in which we reject null hypothesis at 5% level of significance, it shows that South Africa FDI inflow is significant at level only. From the PP-Test it can be concluded that we accept null hypothesis for all the variables except the FDI inflow of India, China and South Africa at 5% level of significance. Both test result shows that all other variables are stationary at difference level and China GDP is stationary at second difference level. To establish any possible association among the variables data will be converted to first difference level to make the data stationary. The test was conducted on the basis of intercept only

H_0 :There is Unit Root Problem.

H_1 :There is no Unit Root Problem

Table 1 : Result of Unit Root Test

Unit Root	ADF		Phillip - Peron		ADF		Phillip - Peron	
Null Hypothesis	T-stats	Prob	T-stats	Prob	T-stats	Prob	T-stats	Prob
BRFDI	-1.259922	0.6426	-4.610349	0.0004	-17.6385	0.0000	-25.3058	0.0001
BREXP	-1.607355	0.4726	-1.621568	0.4658	-3.35182	0.0169	-10.2743	0.0000
BRIMP	-1.098712	0.7107	-1.306806	0.6214	-3.52367	0.0107	-5.90847	0.0000
BRGDP	-0.596255	0.8634	-0.670803	0.8461	-3.78409	0.005	-3.82246	0.0045
RUFDI	-2.543099	0.1105	-3.788084	0.0049	-12.8362	0.0000	-22.4542	0.0001
RUSEXP	-1.437932	0.5576	-1.512435	0.5209	-4.4758	0.0006	-7.12848	0.0000
RUSIMP	-1.347014	0.6018	-1.73929	0.4069	-3.54174	0.0102	-9.62471	0.0000
RUSGDP	-1.52456	0.5148	-1.469214	0.5426	-7.43684	0.0000	-7.58608	0.0000
INDFDI	-0.8745	0.7896	-5.500838	0.0000	-8.256599	0.0000		
INDEXP	-0.921015	0.7753	-0.916921	0.7766	-7.79819	0.0000	-7.79832	0.0000
INDIMP	-1.13924	0.695	-1.094602	0.7129	-7.13117	0.0000	-7.10464	0.0000
INDGDP	1.872381	0.9998	1.856323	0.9997	-4.73074	0.0003	-7.88124	0.0000
CHNFDI	-0.987046	0.7523	-6.426027	0.0000	-4.86725	0.0002		
CHNEXP	-0.85025	0.7969	-0.613132	0.8597	-3.39957	0.0149	-7.48445	0.0000
CHNIMP	-0.962075	0.7613	-1.01246	0.7439	-8.1502	0.0000	-8.43926	0.0000
CHNGDP	-0.812669	0.8084	2.648282	1.0000	-6.91716	0.0000	-4.90047	0.0001
SAFDI	-5.42009	0.0000	-5.416891	0.0000				
SAEXP	-1.355467	0.5984	-1.2953	0.6267	-7.1746	0.0000	-7.48445	0.0000
SAIMP	-1.547699	0.5031	-1.39391	0.5798	-7.46182	0.0000	-8.43926	0.0000
SAGDP	-1.33078	0.6101	-1.35479	0.5987	-6.35985	0.0000	-6.33988	0.0000

Source: Author Compilation

4.2. Cointegration and Johansen Test:-

Cointegration is a regression of a Unit root test time series on another Unit root Time series. Cointegration test shows the long term relationship between the variables. Cointegration means that despite being individually non stationary, a linear combination between two or more time series can be stationary *(Meerza).D*ynamic relationship among the variables are measured using Cointegration analysis. The multivariate Cointegration test based on Johansen - Julius is used to determine the long run relationship *(Miankhel, Thangavelu and Kalirajan 2009)*. The testing hypotheses are the null of non-cointegration against the alternative that is the existence of Cointegration by using the maximum likelihood procedure (*Johansen and Juselius 1990)*. Cointegration is the property of data in time series where variables share common stochastic drift .Johansen Test relies on two types of tests, Eigenvalue and Trace statistics .The Cointegration analysis is multivariate analysis as there cannot be relation between one variable.

Result of Cointegration in Table 2 is analyzed on the non-stationary data to find out the relationship among the variables. Trace test and Max eigenvalue probability at 5% significance level will help to determine whether variables are cointegrated or not . Reject the null hypothesis for all the countries by looking at trace statistics probability value at 5% significance level which shows that there is Cointegration among the variables. In case of Brazil two variables are co integrated as the probability

value of none and at most 1 is less than the critical value, hence null hypothesis is rejected. In case of Brazil GDP and exports are correlated which shows that there is long run relationship among GDP and exports of Brazil.

Table2: Cointegration Test Result

			Trace	0.05		Max Eigenvalue			
Country	No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**	Eigenvalue	Statistic	Critical Value	Prob.**
BRAZIL	None *	0.39957	62.4522	47.85613	0.0012	0.39957	31.11667	27.58434	0.0168
	At most 1 *	0.263422	31.3355	29.79707	0.033	0.263422	18.65012	21.13162	0.033
RUSSIA	None *	0.329328	64.2513	47.85613	0.0007	0.329328	24.36799	27.58434	0.0024
	At most 1 *	0.305251	39.8833	29.79707	0.0025	0.305251	22.21651	21.13162	0.0351
	At most 2 *	0.227887	17.6668	15.49471	0.0232	0.227887	15.7761	14.2646	0.0286
INDIA	None *	0.410088	48.9664	47.85613	0.0392	0.802204	98.85167	27.58434	0.0000
	At most 1	0.142814	16.7717	29.79707	0.6568	0.142814	9.400149	21.13162	0.7989
CHINA	None *	0.802204	127.544	47.85613	0.0000	0.802204	98.85167	27.58434	0.0000
	At most 1	0.239669	28.6924	29.79707	0.0666	0.239669	16.71409	21.13162	0.1859
SA	None *	0.346054	51.5978	47.85613	0.0214	0.346054	25.90859	27.58434	0.0206
	At most 1	0.241369	25.6892	29.79707	0.1382	0.241369	16.85061	21.13162	0.1792

Max Eigenvalue probability also shows two Cointegration equations by rejecting the null hypothesis. In case of Russia more than two variables are cointegrated as trace stats p -value and Max Eigenvalue for At most 2 Cointegration equation are less than 0.05 .So, null hypothesis will be rejected at 5% level of significance which shows that there is long run equilibrium relationship among export , FDI and GDP . Eigenvalue result shows the positive relationship among FDI, export and GDP. In case of India only export and FDI are positively correlated with the probability value of trace statistics 0.0392 which reject null hypothesis at 5% level of significance. In China also only FDI and exports are positively correlated In South Africa export and GDP are positively correlated. The correlation among the variables shows the long term relationship among these variables. In all the countries there is at least one variable which is correlated. Result of Trace statistics and max eigenvalue of Cointegration test based on Johansen co integration reject the null hypothesis that there exists no co integration at 95% confidence interval. This shows the long run relationship among the non-stationary variables and so Vector error correction model (VECM) model should be used

Vector Error Correction Model.

The study confirms the existence of correlation among the variables which shows the long run relationship among the variables. So VECM model will be applied for the evaluation of short run properties of the cointegrated variable. In case of no cointegrated equation, it shows the short run relationship between variables and no need for VECM analysis and to directly proceed for Granger – Causality. Cointegration rank in VECM shows the number of factors cointegrated. A negative and significant coefficient of the ECM (i.e. *et-1* have been used in the above equations) indicates that any short-term. Fluctuations between the independent variables and the dependent variable will give rise to a stable long run relationship between the variables. *(Fadli Fizari Abu Hassan Asari, 2011)*. VECM helps us to know that the past value of independent variable have impact on the present value of dependent variable.

Table3

VECM Analysis - Brazil

	Coefficient	Std. Error	t-Statistic	Prob.
(EXPO(-1))	3.251054	1.062381	3.060158	0.0035***
D(EXPO(-1))	-4.505892	2.905373	-1.55088	0.1271
D(EXPO(-2))	0.728236	2.659327	0.273842	0.7853
D(FDI(-1))	-12.88449	5.518386	-2.33483	0.0235**
D(FDI(-2))	-1.518039	3.762826	-0.40343	0.6883
D(GDP(-1))	0.381034	0.245271	1.553519	0.1265
D(GDP(-2))	-0.381687	0.199374	-1.91443	0.0612*
D(IMPO(-1))	15.78833	5.483565	2.879209	0.0058***
D(IMPO(-2))	1.810945	5.43458	0.333226	0.7403
constant	22320.5	8686.401	2.569591	0.0131**

Source: Author Compilation

Denote significance level *** at 1%, ** at 5% and * at 10%

Table4

VECM Analysis - Russia

	Coefficient	Std. Error	t-Statistic	Prob.
(EXPO(-1))	0.265142	0.174424	1.520097	0.1347
D(EXPO(-1))	0.105853	1.019191	0.10386	0.9177
D(EXPO(-2))	1.081728	0.980585	1.103146	0.2751
D(FDI(-1))	-0.50334	1.379197	-0.36495	0.7167
D(FDI(-2))	-0.48631	1.06175	-0.45803	0.6489
D(GDP(-1))	0.32538	0.242266	1.343073	0.1852
D(GDP(-2))	-0.48904	0.256175	-1.90899	0.0619*
D(IMPO(-1))	-1.4834	1.079893	-1.37366	0.1756
D(IMPO(-2))	-0.32633	1.199513	-0.27205	0.7867
constant	4313.675	5279.632	0.817041	0.4177

Source: Author Compilation

Denote significance level *** at 1%, ** at 5% and * at 10%

Table5

VECM Analysis - India

	Coefficient	Std. Error	t-Statistic	Prob.
(EXPO(-1))	-10.01068	10.24611	-0.97702	0.3332
D(EXPO(-1))	-4.306019	14.08727	-0.30567	0.7611
D(EXPO(-2))	-2.993856	12.769	-0.23446	0.8156
D(FDI(-1))	0.428311	44.15062	0.009701	0.9923
D(FDI(-2))	16.98834	32.11242	0.529027	0.5991
D(GDP(-1))	0.116015	0.154074	0.752986	0.4549
D(GDP(-2))	-0.354139	0.166133	-2.13165	0.0379**
D(IMPO(-1))	2.52099	8.633447	0.292003	0.7715
D(IMPO(-2))	0.419899	6.557576	0.064033	0.9492
constant	121557.1	38103.64	3.190169	0.0024***

Source: Author Compilation

Denote significance level *** at 1%, ** at 5% and * at 10%

Table 6

VECM Analysis – China

	Coefficient	Std. Error	t-Statistic	Prob.
(EXPO(-1))	0.159721	0.13957	1.144376	0.2578
D(EXPO(-1))	-0.608372	0.267526	-2.27407	0.0272**
D(EXPO(-2))	-0.453014	0.265711	-1.70492	0.0943*
D(FDI(-1))	-0.263994	0.468618	-0.56335	0.5757
D(FDI(-2))	-0.158443	0.320643	-0.49414	0.6233
D(GDP(-1))	1.083464	0.167759	6.458462	0.0000***
D(GDP(-2))	-0.179094	0.162773	-1.10027	0.2764
D(IMPO(-1))	0.680212	0.344328	1.975479	0.0536**
D(IMPO(-2))	0.970346	0.386057	2.513479	0.0152**
constant	13538.25	9428.83	1.435836	0.1572

Source: Author Compilation

Denote significance level *** at 1%, ** at 5% and * at 10%

Table7– VECM Analysis South Africa

	Coefficient	Std. Error	t-Statistic	Prob.
(EXPO(-1))	-0.97674	0.491746	-1.98628	0.0524**
D(EXPO(-1))	-4.72817	2.594259	-1.82255	0.0742**
D(EXPO(-2))	2.537218	2.80091	0.905855	0.3693
D(FDI(-1))	2.915408	1.70902	1.705895	0.0941*
D(FDI(-2))	1.764678	1.758797	1.003344	0.3204
D(GDP(-1))	0.149558	0.239546	0.624339	0.5352
D(GDP(-2))	-0.32998	0.228269	-1.44556	0.1544
D(IMPO(-1))	5.868666	5.407806	1.085221	0.2829
D(IMPO(-2))	-6.97895	4.151278	-1.68116	0.0988*
constant	4128.774	2240.875	1.842483	0.0712*

Source: Author Compilation

Denote significance level *** at 1%, ** at 5% and * at 10%

Result of Vector Error Correction Model in Table.4. is done using intercept and no trend in linear trend deterministic trend specification. Co-efficient of the variable in the result shows that whether today's value is affected by the past value of that variable. Cointegration result shows that in all countries at least one variable is cointegrated, so VECM is applied with one or two cointegrating factor and two lags in each country equation has been estimated. Selection of lag length criteria is based on AIC and SICS value. From the result 3 it can be said that for Brazil lag 1 of expo is significant at 1%, lag1 of differenced FDI and lag1of differenced import is significant at 5% and 1% respectively. The coefficient value of expo is positive with the convergence speed to its equilibrium is 3.25%. It means that in short run exports are adjusted by 4.5% of deviation from its equilibrium from the past quarter. It shows that increase in export in last quarter by 1% will increase the GDP by 3.25% in present quarter. The negative coefficient value of lag difference of FDI which is significant at 5% level of significance shows long term relationship with GDP .The negative coefficient and significant variables shows that there is causal relationship among the variables in the long run. Joint F-test of coefficient of independent variable shows the short run relationship among the dependent and independent variable. Result of Table.4. shows that lag of GDP of past two quarter is significant. The coefficient value of GDP is negative with the convergence speed to its equilibrium is -0.48 %. It means that in short run GDP are adjusted by 4.8% of deviation from its equilibrium from the past two quarter. There is short run relationship among change in GDP itself. Table 5 shows the VECM result of India which also shows that short run GDP are adjusted by 3.5% of deviation from its equilibrium from the past two quarter. There is short run relationship among change in GDP itself. Table6 shows the result of China where the variables which have short run relationship between lag 1 and 2 of export.

Granger Causality

The Granger causality test assumes that the information relevant to the prediction of the respective variables is contained solely in the time series data on these variables (Gujarati 1998). Although Cointegration shows the long run relationship among the variables but direction of causal relation is not specified in Cointegration. So, to know the direction of causal relationship or long term movement, granger causality test is used. Granger causality uses chi-square statistics and probability value to know the direction in which the variables cause each other. Hypothesis is checked using F-statistics value. Chi-Square statistics and probability values constructed under the null hypothesis of non-causality show that

there is a causal relationship between those variables (***Fadli Fizari Abu Hassan Asari N. S., 2011***)

Table 8 : Granger Causality Result – Brazil

Null Hypothesis	F-Statistic	Prob.	Decision
DFDI does not Granger Cause DEXPO	2.66177	0.0432**	Reject
DEXPO does not Granger Cause DFDI	4.04929	0.0064***	Reject
DGDP does not Granger Cause DEXPO	4.65964	0.0028***	Reject
DEXPO does not Granger Cause DGDP	1.23069	0.3098	Accept
DIMPO does not Granger Cause DEXPO	3.58055	0.0121**	Reject
DEXPO does not Granger Cause DIMPO	3.77345	0.0093***	Reject
DGDP does not Granger Cause DFDI	1.39952	0.2477	Accept
DFDI does not Granger Cause DGDP	1.45175	0.2309	Accept
DIMPO does not Granger Cause DFDI	4.40908	0.0039***	Reject
DFDI does not Granger Cause DIMPO	2.19449	0.083*	Reject
DIMPO does not Granger Cause DGDP	1.71927	0.1605	Accept
DGDP does not Granger Cause DIMPO	9.74745	0.0000***	Reject

Source: Author Compilation

Denote significance level *** at 1%, ** at 5% and * at 10%

Table 9 : Granger Causality Result – Russia

Null Hypothesis	F-Statistic	Prob.	Decision
DFDI does not Granger Cause DEXPO	2.66177	0.0432**	Reject
DEXPO does not Granger Cause DFDI	4.04929	0.0064***	Reject
DGDP does not Granger Cause DEXPO	4.65964	0.0028***	Reject
DEXPO does not Granger Cause DGDP	1.23069	0.3098	Accept
DIMPO does not Granger Cause DEXPO	3.58055	0.0121**	Reject
DEXPO does not Granger Cause DIMPO	3.77345	0.0093***	Reject
DGDP does not Granger Cause DFDI	1.39952	0.2477	Accept
DFDI does not Granger Cause DGDP	1.45175	0.2309	Accept
DIMPO does not Granger Cause DFDI	4.40908	0.0039***	Reject
DFDI does not Granger Cause DIMPO	2.19449	0.083*	Reject
DIMPO does not Granger Cause DGDP	1.71927	0.1605	Accept
DGDP does not Granger Cause DIMPO	9.74745	0.0000***	Reject

Source: Author Compilation

Denote significance level *** at 1%, ** at 5% and * at 10%

Table 10: Granger Causality Result – India

Null Hypothesis	F-Statistic	Prob.	Decision
DFDI does not Granger Cause DEXPO	3.9867	0.0070	Reject
DEXPO does not Granger Cause DFDI	1.1511	0.3436	Accept
DGDP does not Granger Cause DEXPO	1.4271	0.2387	Accept
DEXPO does not Granger Cause DGDP	1.8010	0.1434	Accept
DIMPO does not Granger Cause DEXPO	0.7633	0.5542	Accept
DEXPO does not Granger Cause DIMPO	2.2826	0.0734	Accept
DGDP does not Granger Cause DFDI	3.8248	0.0087	Reject
DFDI does not Granger Cause DGDP	0.8369	0.5083	Accept
DIMPO does not Granger Cause DFDI	0.6959	0.5984	Accept
DFDI does not Granger Cause DIMPO	6.0646	0.0005	Reject
DIMPO does not Granger Cause DGDP	2.5311	0.0519	Accept
DGDP does not Granger Cause DIMPO	0.6437	0.6339	Accept

Source: Author Compilation

Denote significance level *** at 1%, ** at 5% and * at 10%

Table 11: Granger Causality Result – China

Null Hypothesis	F-Statistic	Prob.	Decision
DFDI does not Granger Cause DEXPO	1.0494	0.3913	Accept
DEXPO does not Granger Cause DFDI	0.3933	0.8125	Accept
DGDP does not Granger Cause DEXPO	1.3760	0.2556	Accept
DEXPO does not Granger Cause DGDP	4.8622	0.0022	Reject
DIMPO does not Granger Cause DEXPO	9.9943	0.0000	Reject
DEXPO does not Granger Cause DIMPO	8.5941	0.0000	Reject
DGDP does not Granger Cause DFDI	0.1081	0.9791	Accept
DFDI does not Granger Cause DGDP	2.1762	0.0851	Accept
DIMPO does not Granger Cause DFDI	0.2832	0.8875	Accept
DFDI does not Granger Cause DIMPO	1.4031	0.2465	Accept
DIMPO does not Granger Cause DGDP	2.3267	0.0690	Accept
DGDP does not Granger Cause DIMPO	0.7470	0.5646	Accept

Source: Author Compilation

Denote significance level *** at 1%, ** at 5% and * at 10%

Table 12: Granger Causality Result – South Africa

Null Hypothesis:	F-Statistic	Prob.	Decision
DFDI does not Granger Cause DEXPO	0.8839	0.4804	Accept
DEXPO does not Granger Cause DFDI	1.0937	0.3699	Accept
DGDP does not Granger Cause DEXPO	3.9785	0.0070	Reject
DEXPO does not Granger Cause DGDP	1.7261	0.1590	Accept
DIMPO does not Granger Cause DEXPO	1.1769	0.3323	Accept
DEXPO does not Granger Cause DIMPO	9.3482	0.0000	Reject
DGDP does not Granger Cause DFDI	0.4283	0.7875	Accept
DFDI does not Granger Cause DGDP	2.4698	0.0565	Accept
DIMPO does not Granger Cause DFDI	2.9679	0.0282	Reject
DFDI does not Granger Cause DIMPO	1.4230	0.2401	Accept
DIMPO does not Granger Cause DGDP	1.4288	0.2382	Accept
DGDP does not Granger Cause DIMPO	10.5124	0.0000	Reject

Source: Author Compilation

Denote significance level *** at 1%, ** at 5% and * at 10%

Above tables shows the granger causality pair-wise analysis result. Probability value at 1% and 5% level of significance denotes the rejection of null hypothesis. In Table 3.8 in case of Brazil it is found that FDI granger cause export and export also granger cause FDI which shows bi-directional relationship among them. GDP granger cause expo but expo does not cause GDP which shows uni-directional relationship. There is also bi-directional relationship between import and export and import and FDI as both causes each other. There is uni – directional relationship among GDP and import as only GDP cause import. There is no relationship between GDP and FDI which shows that change in FDI in short period does not have any effect on GDP of Brazil. In case of Russia there is bi-directional relationship between GDP and expo , Import and expo, import and FDI and between import and GDP. There is uni-directional relationship between GDP and FDI in Russia and no-directional relationship between FDI and expo which shows that change in expo performance in short run will not affect the FDI inflow in Russia. In India analysis result there is no bi-directional relationship. There is uni-directional relationship FDI and expo, GDP and expo and FDI and import which shows that all the variables have short run relationship with FDI which shows that change in FDI in short period will cause change in import, export as well as GDP. Result also shows that there is no relationship among GDP and export, Import and export and GDP and import. It shows that India's GDP is not affected by short run change in import or export. In case of China there exist bi-directional relationship among import and export only. There is uni-directional relationship exist also among one variable only that is between export and GDP and the other variable does not cause any variable. It shows that there is short term association between export and import and export and GDP which shows that in China change in export for a short period will cause variation in their GDP. In case of South Africa there is no bi-directional relationship among the variables. There is only uni-directional relationship among some variables that is GDP causes export, export causes import, import causes FDI and GDP causes import. Rest of the variable does not cause each other which shows that short run changes among them does not impact each other.

FINDINGS AND CONCLUSION

- In Brazil it is found that FDI granger causes export and export also grangers cause FDI which shows bi-directional relationship among them. GDP granger cause expo but expo does not cause GDP which shows uni-directional relationship. There is also bi-directional relationship between import and export and import and FDI as both causes each other. There is uni – directional relationship among GDP and import as only GDP cause import.

- In Russia there is bi-directional relationship between GDP and export, Import and export, import and FDI and between import and GDP. There is uni-directional relationship between GDP and FDI in Russia and no-directional relationship between FDI and expo which shows that change in expo performance in short run will not affect the FDI inflow.

- India result shows there is no bi-directional relationship. There is uni-directional relationship FDI and export, GDP and expo and FDI and import which show that all the variables have short run relationship with FDI which shows that change in FDI in short period will cause change in import, export as well as GDP. Result also shows that there is no relationship among GDP and export, Import and export and GDP and import.

- China there exist bi-directional relationship among import and export only. There is uni-directional relationship exist also among one variable only that is between export and GDP and the other variable does not cause any variable. There is short term association between export and import and export and GDP which shows that in China change in export for a short period will cause variation in their GDP.

- South Africa there is no bi-directional relationship among the variables. There is only uni-directional relationship among some variables that is GDP causes export, export causes import, import causes FDI and GDP causes import. Other variable does not cause each other which shows that short run changes among them does not impact each other

CONCLUSION

To study the causal relationship among Economic Growth, Import, Export and FDI of BRICS economy quarterly data is used from 2000 to 2015. The study is done individually for all the BRICS countries individually. In Brazil it is found that there is bi-directional relationship among FDI and Export and Import and Export which shows that short run changes among these variables impact each other. In Russia there is bi-directional relationship between GDP and Export , Import and Export, Import and FDI and between import and GDP. In India it shows that there is no variables which impact each other .There is only uni-directional relationship FDI and Export, GDP and Export and FDI and Import which shows that these variables have short run impact. China there exist bi-directional relationship among Import and Export only which shows that there is short run relationship among Export and Import of China. In South Africa it shows that there is no variable which impact each other .There is only uni-directional relationship among some variables that is GDP causes Export, Export causes Import, Import causes FDI and GDP causes Import.

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