Sustainable Development Goals and Economic Growth in Emerging Economies: A Study of Sustainability Through International Investments

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Abstract: Decent work and economic growth are one of the crucial segments of Sustainable development goals, for which an attempt is made in the context of emerging nations to achieve economic growth through International support of investments. This study investigates the impact of international investments, i.e. FDI & FII on the growth of its economy. FDI & FII are attracted with the resources possessed by the country, which allows them on the condition that they will generate employment and bring technological innovations with them. This paper attempts to study those impacts and measure the growth of the economy, resulting thereby.

Keywords: Sustainable Development, International Investments, Trade, Growth, Emerging Economies

JEL Classification: A11, A13, B22, B26, B27

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1. Introduction

International Investments was not much focussed until the world realised its importance for economic development. But like every progress, it also needed check for sustainability. In around 1990, these international investments raised to the US $4.3 trillion (World Bank, 1992). This was the era, where many emerging economies just entered into the new phase of globalisation. Out of total all the countries in the world, many economies were still struggling long debates of trade benefits in the early 90s. Emerging countries like Brazil, Russia, India, China and South Africa which are now part of BRICS' (an association of five emerging economies) didn't support much of the foreign investments back then. But to compete with the developed nations, these economies allowed trade and exchange. But even after so many years, the question remained unanswered about how international investments helped the economy to grow sustainably.

Trade between the countries was started with the sole intention of increased profits by business personnel. Sustainability and trade were poles apart in the economic literature till then. Later, Neoclassical theory suggested that trade is efficient as it allows production with the capacity of resources deployed (Campus, 1987). A report by the world commission on environment and development (WCED) in 1987 was the first to highlight the concern over the extinction of resources in the race of development. But not everyone was appeased with the theory.

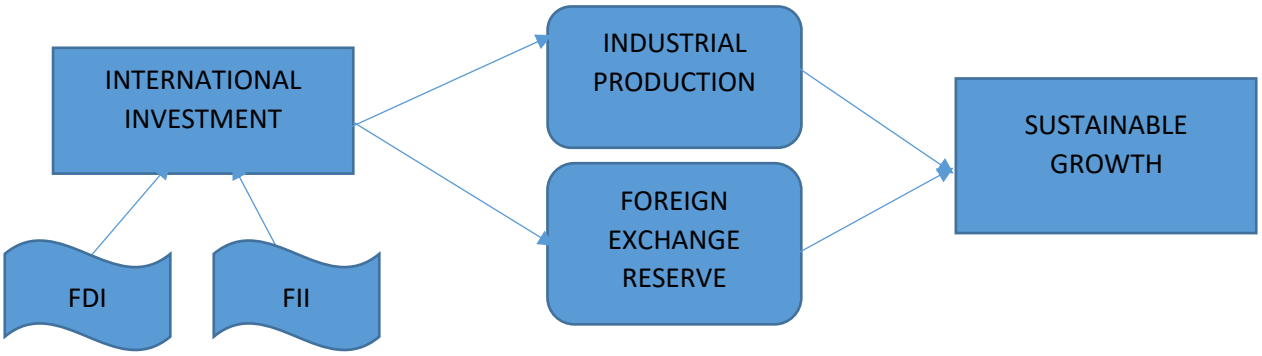
A report by Weiss's (1922) mentioned about a statement given by Arhur Dunkel in support stating trade as the facilitator of sustainable development. This is also the valid thought which provoked WTO to amend their trade policies favouring development with sustainability. But as easy as it may sound, the truth was much different. WTO took 20 years to approve new policies since the first concerned was raised by UN on Human Environment. Many developing economies felt environmental problems are the result of industrialisations, and they have no share in it. They also feared any new restrictions would slow down their initial plans of growth. Where some nations started allocating their funds towards environment protection, few economies like India, South Africa and Russia were struggling to endure their drowning economies. Their only saviour hope was found in capital relocation from developed countries.

2. Theoretical Framework

Analysis of the links between trade and sustainability naturally draws from international trade theory (Copeland & Taylor, 1994, 2003; Grossman & Krueger, 1991). Trade affects sustainability directly through natural resource exchanges, but it only became possible with trade liberalisation. Even though the trade between economies started early in the 16th century known as mercantilism, but economists gave theories on trade later in the 18th and 19th century. Exchange was essential for all the economies as they have limited resources based on their geographical locations (Goel & Singh, 2020). This was also the basic principle of international trade theory which impacts the natural environment. The comparative advantage theory given by David Ricardo in 1817 was based on neo-classical theories of trade. This theory claimed that in a given set of the country, both the economies are benefitted with trade because of specialisation (Leamer, 1984). Here countries initiate trade because they have a competitive advantage over other nations. Economists argued that international trade helps in facilitating the potential use of resources by exchanging the one in which the respective country excels. This theory appreciated the advantages of a trade by defining sustainable development as part of it. Because, when the economy trade in the goods in which they are have comparative advantage then they are utilising the resources potentially to their best levels and helping the

environment by taking it closer to sustainable development. Inspired by the theory, the following model is perceived for the study.

Figure 1: Model Perceived for the Study



The above model perceived for the study is designed to describe the relationship between international investment and sustainable growth of the emerging economies. In the centre are two macro-economic variables: industrial production and foreign exchange reserve. Both of these variables are affected by international investments. Also, these two variables try to contribute to the sustainable development of the country healthily. Industrial production is the variable which reflects the total produce of Industries and Foreign Exchange reserve is the difference between total exports from a country to total imports in a country. Also, any increase in exchange reserve means that exports from the country are rising and imports are declining. Further, it is seen that FDI (Foreign Direct Investment) and FII (Foreign International Investment) are the real contributors to International Investment.

3. Review of Literature

Trade helps in utilising resources to the best and thereby promotes the sustainability of assets. Through trade also comes foreign capital which also brings various resources to improve the level of production like technology and innovations (Balasubramanyam *et al*. 1996; Blomstrom *et al*., 1996; Borensztein *et al*., 1998). Adding to it, Lee (1995), Kraay (1999), Coe and (1995) stated that exchange between the economies makes a competent asset reallocation which helps in static gains and also pushes favourable circumstances in the type of an extended market for domestically produced goods, and quicker efficiency development, by securing new information and ideas. Benefits of international investments are not only restricted to technology there are many other benefits of it which helps the economy to grow (Le &Ataullah, 2006; Azam & Hassan, 2013; Haseeb *et al*. 2014; Azam & Gavrila, 2015). Coe *et al*. (1997) highlighted the affirmative relationship among FDI and development of economy, however, suggested that the host nation ought to have an achieved degree of improvement that encourages it in order to receive the rewards of higher efficiency.

Notwithstanding, there additionally exist repudiating hypotheses that foresee international investment within sight of prior exchange, cost-related and different mutilations will hurt asset allotment and moderate development (Prabhakar *et al*., 2015). Investments from across the nation help emerging nations proliferate. Emerging nations like BRICS' are the powerhouse of

resources like human capital, raw material, but financial capital is equally essential in the growth of the country, and through FDIs and FIIs these countries bounce high with production. Apart from these studies, there were few studies which proved different results about international investments and growth. Alfaro (2003) did a study on the impacts of international investments on the primary market only to find out the negative relationship between them.

Further, Agénor and Aynaoui (2015) also tested the results for Morocco and concluded the antagonistic relation between growth and international investments. Not only harmful, but there are also studies which prove that international investments do not have any effect at all on the economy. These mixed results and analysis performed in various economies helped discovered the research gap in the study.

4. Research Gap

Various studies conducted concerning trade and sustainability are related to theoretical aspects of trade supported with empirical evidence (Atkinson & Hamilton, 2002). Thorough research has not been done with the current angle of financial models. This paper tries to fill this gap by measuring the relationship of international trade with a sustainable growth of the emerging economies.

5. The Objective of the study

The objective of this study is to measure the impact of international investments on sustainable growth by measuring the effect first on industrial production and then on foreign exchange reserve which contributes to the sustainable growth of emerging economies BRICS'.

6. Research Methodology

In order to achieve the objective of the paper, an empirical research analysis design is pursued the study. The sample taken for this study is about five different macro-economic variables, *viz*. FDI and FII taken as a proxy of international investment; industrial production index taken as a proxy for a total production of the country in a financial year; foreign exchange reserve to define the capacity of difference between exports and imports and Gross Domestic Product is proxy for sustainable growth of the economy. The study period chosen is eleven years from January 2009-2019, and Eviews 9 is the software used for all the statistical analysis. The data used in this research is the secondary type and gathered from sources like worldbank.com, trading economic and verified through the Bloomberg database.

Table1: *Reflecting Proxies for variables selected in the study*

S. No	**Variables**	**Proxy**
1.	International Investment	FDI , FII
2.	Industrial Production	Industrial Production Index
3.	Foreign Exchange Reserve	Export- Import
4.	Sustainable Growth	Growth Per Capita (GDP)

6.1 Statistical Tools Used

In requirement of assessment for the general pattern and trend of the dataset first descriptive statistics defining mean, median, mode, standard deviation, skewness and kurtosis are used. After which to avoid any non-stationarity problems in the time series data ADF unit root is carried out. Granger-causality test has been used to define the cause and effect relationship between the variables in all the equations defined below for the short run. Similarly, to measure the effect of long-run Johnson's co-integration is applied for mapping the integration. Lastly, to check the validity of the model perceived in the study, panel regression is exercised.

6.2 Hypotheses of the Study

H_{o1}: International Investments do not contribute in Industrial production of BRICS' Economies.

Ha_1: International investments contribute in Industrial production of BRICS' Economies.

Ho_2: International Investments do not impact Foreign Exchange Reserve.

Ha_2: International Investments impact Foreign Exchange Reserve.

H_{o3}: International Investments are not impacting Sustainable growth of BRICS' Economies.

Ha_3: International Investments are impacting Sustainable growth of BRICS' Economies.

$$FDI_{BRICS=} \alpha + \beta_1(IIP)_{BRICS} + \varepsilon t \quad .....(1)$$

$$FII_{BRICS=} \alpha + \beta_1(IIP)_{BRICS} + \varepsilon t \quad .....(2)$$

$$FDI_{BRICS=} \alpha + \beta_1(FER)_{BRICS} + \varepsilon t \quad .....(3)$$

$$FII_{BRICS=} \alpha + \beta_1(FER)_{BRICS} + \varepsilon t \quad ..…(4)$$

$$GDP_{BRICS=} \alpha + \beta_1(IIP)_{BRICS} + \beta_2(FER)_{BRICS} + \varepsilon_t \quad …..(5)$$

Where,

IIP is Index of Industrial Production; FER is Foreign Exchange Reserve; GDP is Gross Domestic Product and BRICS stands for Brazil, Russia, India, China and South Africa respectively.

6.3 Descriptive Statistics

Mean Values from Table 2, predict that highest reserve of foreign exchange stays with Russia among BRICS', followed by Brazil, China, India and South Africa. Whereas, looking at the skewness, it is found that India is not on the favourable side, apart from which other BRICS' nations are positively skewed and shows good hold of foreign currencies with these countries.

Table 2 : *Results of Descriptive statistics for Foreign Exchange Reserve*

Foreign Exchange Reserve					
	Brazil	Russia	India	China	South Africa
Mean	331656	390779	299411	3160575	331656
Median	356587	395480	282763	3194613	356570
Maximum	373660	483887	399452	3993218	373660
Minimum	185891	297084	238615	1912067	185855
Std. Dev.	54652	59709	46378	500518.6	54643.4
Skewness	-1.518	-0.0906	0.6044	-0.56525	-1.5181
Kurtosis	3.8176	1.4975	2.0042	2.0193	2.8175
Jarque-Bera	49.484	11.465	12.262	6.3916	49.4942
Probability	0	0.0022	0.0021	0.0402	0

From Table 3, India can be seen leading with highest mean value amongst all reflecting the highest industrial production of all followed by China closely and then Brazil, South Africa and Russia at last. Looking at the skewness, its seen China tails it towards the right while all others are tailing it towards left, resulting in negative skewness.

Table 3: *Results of Descriptive statistics for Industrial Production Index*

Industrial Production Index					
	Brazil	Russia	India	China	South Africa
Mean	103.49	97.9285	113.665	109.49	98.3075
Median	103.72	99.43	113.85	108.85	99.41
Maximum	118.14	108.3	141.9	118.5	103.61
Minimum	85	81.01	84.7	105.6	87.21
Std. Dev.	9.041	7.1363	13.0787	3.5743	3.8223
Skewness	-0.3015	-0.632	-0.2662	0.8647	-1.2459
Kurtosis	2.3824	2.6944	2.8279	2.8279	2.1213
Jarque-Bera	1.242	2.8189	0.5218	5.0349	12.4442
Probability	0.5373	0.2442	0.7703	0.0806	0.0019

Table 4 shows the growth of all the five emerging economies is closely competing with each other. Beating all China and India are on the lead with Brazil, South Africa and Russia being too close. Staring at skewness provides a similar scenario where it is negative for India and positive for all other nations.

Table 4: *Results of Descriptive Statistics for Growth Domestic Product*

Growth Domestic Product					
	Brazil	Russia	India	China	South Africa
Mean	99.9368	99.653	99.9614	99.9886	99.7848
Median	100.349	99.6962	99.9532	99.961	100.104
Maximum	102.3207	101.1604	102.5858	101.0037	100.8535
Minimum	96.5445	97.1542	97.4392	97.8481	96.3775
Std. Dev.	1.582	1.0577	1.1498	0.6393	0.978
Skewness	-0.5024	-0.5099	0.3205	-1.0689	-2.1791
Kurtosis	2.1905	2.5402	3.0964	2.9279	2.3886
Jarque-Bera	8.3266	6.2573	2.1016	41.4359	191.2705
Probability	0.0155	0.0437	0.3496	0.00001	0.00001

6.4 Unit Root Test

Table 5 (part-a) shows the results of the ADF test at the level and (part-b) shows the results of the same test at the first difference. It is observed from the table (part-a) that the null hypothesis of Foreign exchange reserve has a unit root and cannot be rejected at the level based on ADF test results. This indicates that the Foreign Exchange Reserve series of BRICS are non-stationary, therefore, showing not fit for further econometric tests. However, from part b, it can be observed that the alternate hypothesis data does not have a unit root and can be accepted at 5% significance level based on ADF test results. Therefore, it makes the Foreign Exchange reserve of BRICS fit for further econometric tests.

Table 5: *Results of Unit Root for Foreign Exchange Reserve*

Foreign Exchange Reserve Part-A				**Foreign Exchange Reserve Part – B**			
Variable at Level				**Variable at 1st Difference**			
Countries	**Total Period**		**Remarks**	**Countries**	**Total Period**		**Remarks***
	ADF statistic	**p-value**			**ADF statistic**	**p-value**	
Brazil	-5.1548	0.0001	Non-Stationary	ΔBrazil	-6.02584	0.0001	Stationary
Russia	-0.6449	0.8551	Non-Stationary	ΔRussia	-8.83669	0.0001	Stationary
India	-0.7105	0.8392	Non-Stationary	ΔIndia	-9.15528	0.0001	Stationary
China	-2.7405	0.0704	Non-Stationary	ΔChina	-13.8563	0.0001	Stationary
South Africa	-5.1548	0.0001	Non-Stationary	ΔSouth Africa	-6.02584	0.0001	Stationary

Note: Critical Value at 10% = -2.581041, 5% = -2.888157 and 1% = -3.491345
** Found significant at p-values 1%, 5% and 10% levels*

Table 6 (part-a) shows the results of the ADF test at the level and (part-b) shows the results of the same test at the first difference. It is observed from the table (part-a) that the null hypothesis of the Industrial Production Index has a unit root and cannot be rejected at the level based on ADF test results. This indicates that the Industrial Production Index series of BRICS' are non-stationary, therefore, showing not fit for further econometric tests. But from part b, it can be observed that the alternate hypothesis data does not have a unit root and can be accepted at 5% significance level based on ADF test results. Therefore, it makes the Industrial Production Index of BRICS' fit for further econometric tests.

Table 6: *Results of Unit Root for Industrial Production*

Industrial Production Part-A				**Industrial Production Part – B**			
Variable at Level				**Variable at 1st Difference**			
Countries	**Total Period**		**Remarks**	**Countries**	**Total Period**		**Remarks***
	ADF statistic	**p-value**			**ADF statistic**	**p-value**	
Brazil	-1.1627	0.6793	Non-Stationary	Δ Brazil	-3.5659	0.0018	Stationary
Russia	-3.1432	0.0317	Non-Stationary	Δ Russia	-8.3741	0.0045	Stationary
India	-1.1478	0.6842	Non-Stationary	Δ India	-4.2754	0.0019	Stationary
China	-1.0917	0.7095	Non-Stationary	Δ China	-4.8884	0.0003	Stationary
South Africa	-2.8189	0.0648	Non-Stationary	Δ South Africa	-9.8557	0.0000	Stationary

Note: Critical Value at 10% = -2.581041, 5% = -2.888157 and 1% = -3.491345
** Found significant at p-values 1%, 5% and 10% levels*

Table 7 (part-a) shows the results of the ADF test at the level and (part-b) shows the results of the same test at the first difference. It is observed from the table (part-a) that the null hypothesis of Gross Domestic Product has a unit root and cannot be rejected at the level based on ADF test results. This indicates that the Gross Domestic Product series of BRICS' are non-stationary, therefore, showing not fit for further econometric tests. However, from part b, it can be observed that the alternate hypothesis data does not have a unit root and can be accepted at 5% significance level based on ADF test results. Therefore, it makes the Gross Domestic Product of BRICS' fit for further econometric tests.

Table 7: *Results of Unit Root for Gross Domestic Product*

GDP Part-A				**GDP Part – B**			
Variable at Level				**Variable at 1st Difference**			
Countries	**Total Period**		**Remarks**	**Countries**	**Total Period**		**Remarks***
	ADF statistic	**p-value**			**ADF statistic**	**p-value**	
Brazil	-2.3590	0.1558	Non-Stationary	Δ Brazil	-2.6331	0.0004	Stationary
Russia	-3.7119	0.0051	Non-Stationary	Δ Russia	-2.3356	0.0005	Stationary
India	-1.9298	0.318	Non-Stationary	Δ India	-4.3729	0.0005	Stationary
China	-2.6761	0.0807	Non-Stationary	Δ China	-2.0742	0.0002	Stationary
South Africa	-3.0811	0.0307	Non-Stationary	Δ South Africa	-1.6485	0.0006	Stationary

Note: Critical Value at 10% = -2.581041, 5% = -2.888157 and 1% = -3.491345
** Found significant at p-values 1%, 5% and 10% levels*

6.5 Granger Causality test

Table 8 shows results of Granger causality test of FDI. From the table, it is found that all the p values of all the BRICS' nations are more than 0.05, which means a null hypothesis is accepted for all of them. All the three variables that are Industrial Production Index, Gross Domestic Product and Foreign Exchange Reserve are not granger causing FDI in any of the BRICS' nations and vice-versa except for one case of South Africa where it is seen that Foreign Exchange Reserve granger causes FDI implying that only Foreign exchange reserve and FDI have a short-run relationship in South Africa rest all do not possess any such relation.

Table 8: *Results of Granger Causality Test of FDI*

Null Hypothesis:	**Brazil**		**Russia**		**India**		**China**		**South Africa**	
	F-Statistic	Prob.	F-Statistic	Prob.	F-Statistic	Prob.	F-Statistic	Prob.	F-Statistic	Prob.
D(FOREIGN_EXC_RES) does not Granger Cause D(FDI)	2.3434	0.1007	1.1112	0.3327	1.2443	0.2921	2.1104	0.1260	5.7365	***0.0042***
D(FDI) does not Granger Cause D(FOREIGN_EXC_RES)	0.4265	0.6538	0.0555	0.946	0.9106	0.4052	1.5865	0.2092	0.3224	0.7025
D(GDP) does not Granger Cause D(FDI)	0.6928	0.5023	0.8485	0.4308	0.0403	0.9605	0.3196	0.7270	0.6889	0.5042
D(FDI) does not Granger Cause D(GDP)	0.4856	0.6166	0.1394	0.8700	0.0047	0.9953	0.1992	0.8197	0.3379	0.7139
D(IPI) does not Granger Cause D(FDI)	0.0869	0.9170	0.9619	0.3931	0.9678	0.3908	1.8974	0.1664	0.3934	0.6781
D(FDI) does not Granger Cause D(IPI)	0.199	0.8205	0.005	0.9950	1.4917	0.2402	0.2681	0.7665	0.6577	0.5249

Table 9 shows that all the p values of all the BRICS' nations are more than 0.05, that means a null hypothesis is accepted for all of them implying that none of the three variables that is Industrial Production Index, Gross Domestic Product and Foreign Exchange Reserve is granger causing FII in any of the BRICS' nations and vice-versa. Therefore it can be concluded that there is no short-run relationship between these variables in these emerging economies.

Table 9: *Results of Granger Causality Test of FII*

Null Hypothesis:	**Brazil**		**Russia**		**India**		**China**		**South Africa**	
	F-Statistic	Prob.	F-Statistic	Prob.	F-Statistic	Prob.	F-Statistic	Prob.	F-Statistic	Prob.
D(FOREIGN_EXC_RES) does not Granger Cause D(FII)	1.032	0.3596	0.6981	0.4993	1.6400	0.1990	0.1814	0.8341	0.98374	0.3771
D(FII) does not Granger Cause D(FOREIGN_EXC_RES)	0.7424	0.4783	0.9181	0.4002	0.17304	0.8414	1.5699	0.2134	5.85E-01	0.5585
D(GDP) does not Granger Cause D(FII)	0.6951	0.5012	0.3861	0.6806	1.9801	0.8203	2.3901	0.7875	1.9132	0.1524
D(FII) does not Granger Cause D(GDP)	0.0531	0.9483	0.3744	0.6885	1.1402	0.9887	8.7402	0.9164	2.03E-01	0.8166
D(IPI) does not Granger Cause D(FII)	0.3015	0.7417	0.5454	0.585	2.9911	0.0677	1.8239	0.1778	1.257	0.2982
D(FII) does not Granger Cause D(IPI)	1.8262	0.1774	0.4329	0.6529	0.374	0.6916	0.7932	0.4611	1.49011	0.2406

6.6 Johansen Co-integration Test

Results of Table 10 It is observed that trace statistic and max- eigenvalues are more than the critical value at 5 per cent level of significance, rejecting the null hypothesis of no co-integrating equation at the level and almost 1 indicating that all the variables do possess long-run relationship between them here in Brazil for both FDI and FII. Except for one unique case where cointegration between FDI & GDP shares one-sided relationship.

Table 10: *Results of Johansen Co-integration Test in Brazil*

Hypothesis	**Null**	**Trace Test**	**Maximum Eigen Value**	**Co-integrating Relationship**	**Number of Co-integrating Relationship**
No Co-integration between FDI & Foreign Exchange Reserve	r=0	47.5049	39.672	Yes	2
	r≤1	7.83283	7.8328		
No Co-integration between FDI & GDP	r=0	44.9504	38.371	yes	1
	r≤1	6.57968	6.5797		
No Co-integration between FDI & Industrial Production Index	r=0	49.4787	29.643	yes	2
	r≤1	19.836	19.836		
No Co-integration between FII & Foreign Exchange Reserve	r=0	69.07526	59.1266	yes	2
	r≤1	9.94861	9.9486		
No Co-integration between FII & GDP	r=0	75.5582	68.55	yes	2
	r≤1	7.00842	7.0084		
No Co-integration between FII & Industrial Production Index	r=0	68.8281	40.292	yes	2
	r≤1	28.5365	28.536		

Source: Author's own calculation

Results of table 11- It is observed that trace statistic and max- eigenvalues are more than the critical value at 5 per cent level of significance, rejecting the null hypothesis of no co-integrating equation at the level and atmost 1 indicating that all the variables do possess long-run relationship between them here in Russia for both FDI and FII. Except for one unique case where cointegration between FDI & GDP shares one-sided relationship in Russia.

Table 11: *Results of Johansen Co-integration Test in Russia*

Hypothesis	Null	Trace Test	Maximum Eigen Value	Co-integrating Relationship	Number of Co-integrating Relationship
No Co-integration between FDI & Foreign Exchange Reserve	r=0	47.5471	35.1716	yes	2
	r≤1	12.3755	12.3755		
No Co-integration between FDI & GDP	r=0	36.79668	31.334	yes	1
	r≤1	5.462689	5.46269		
No Co-integration between FDI & Industrial Production Index	r=0	45.85857	27.495	yes	2
	r≤1	18.36361	18.3636		
No Co-integration between FII & Foreign Exchange Reserve	r=0	36.41370	23.1373	yes	2
	r≤1	13.27636	13.2764		
No Co-integration between FII & GDP	r=0	26.20319	20.7672	yes	2
	r≤1	5.435899	5.43589		
No Co-integration between FII & Industrial Production Index	r=0	39.92055	22.3579	Yes	2
	r≤1	17.56263	17.5626		

Results of Table 12 It is observed that trace statistic and max- eigenvalues are more than the critical value at 5 per cent level of significance, rejecting the null hypothesis of no co-integrating equation at the level and atmost 1 indicating that all the variables do possess long-run relationship between them here in India for both FDI and FII. There are no unique cases where cointegration is one-sided.

Table 12: *Results of Johansen Co-integration Test in India*

Hypothesis	Null	Trace Test	Maximum Eigen Value	Co-integrating Relationship	Number of Co-integrating Relationship
No Co-integration between FDI & Foreign Exchange Reserve	r=0	50.43913	32.22934	yes	2
	r≤1	18.20978	18.20978		
No Co-integration between FDI & GDP	r=0	48.71019	37.85942	yes	2
	r≤1	10.85077	10.85077		
No Co-integration between FDI & Industrial Production Index	r=0	66.17692	46.01168	yes	2
	r≤1	20.16524	20.16524		
No Co-integration between FII & Foreign Exchange Reserve	r=0	41.82426	30.86964	Yes	2
	r≤1	10.95462	10.95462		
No Co-integration between FII & GDP	r=0	31.91188	27.03173	Yes	2
	r≤1	4.880144	4.880144		
No Co-integration between FII &Industrial Production Index	r=0	67.04347	42.44859	yes	2
	r≤1	24.59488	24.59488		

Results of Table 13- It is observed that trace statistic and max- eigenvalues are more than the critical value at 5 per cent level of significance, rejecting the null hypothesis of no co-

integrating equation at the level and at most 1 indicating that all the variables do possess long-run relationship between them here in China for both FDI and FII. There are two one unique cases where cointegration is one-sided, that is between FDI-GDP and FII- Foreign Exchange reserve.

Table 13: *Results of Johansen Co-integration Test in China*

Hypothesis	Null	Trace Test	Maximum Eigen Value	Co-integrating Relationship	Number of Co-integrating Relationship
No Co-integration between FDI & Foreign Exchange Reserve	r=0	54.55642	46.69645	yes	2
	r≤1	7.859974	7.859974		
No Co-integration between FDI & GDP	r=0	55.27464	51.10499	yes	1
	r≤1	4.169651	4.169651		
No Co-integration between FDI & Industrial Production Index	r=0	56.07713	34.94017	yes	2
	r≤1	21.13696	21.13696		
No Co-integration between FII & Foreign Exchange Reserve	r=0	31.35324	24.18444	Yes	1
	r≤1	7.168808	7.168808		
No Co-integration between FII & GDP	r=0	27.39536	23.12393	Yes	2
	r≤1	4.271433	4.271433		
No Co-integration between FII & Industrial Production Index	r=0	38.52126	25.44197	Yes	2
	r≤1	13.07929	13.07929		

Source: Author's own calculation

From table 14, it is observed that trace statistic and max- eigenvalues are more than the critical value at 5 per cent level of significance, rejecting the null hypothesis of no co-integrating equation at the level and at most 1 indicating that all the variables do possess long-run relationship between them here in South Africa just like India for both FDI and FII. Also, no unique case where co-integration is one-sided was found here.

Table 14: *Results of Johansen Co-integration Test in South Africa*

Hypothesis	Null	Trace Test	Maximum Eigen Value	Co-integrating Relationship	Number of Co-integrating Relationship
No Co-integration between FDI & Foreign Exchange Reserve	r=0	50.84787	42.82499	yes	2
	r≤1	8.022886	8.022886		
No Co-integration between FDI & GDP	r=0	56.23582	51.75266	yes	2
	r≤1	4.483161	4.483161		
No Co-integration between FDI & Industrial Production Index	r=0	57.93806	34.36245	yes	2
	r≤1	23.57615	23.57615		
No Co-integration between FII & Foreign Exchange Reserve	r=0	44.6388	35.54122	Yes	2
	r≤1	9.097578	9.097578		
No Co-integration between FII & GDP	r=0	33.03487	28.62266	Yes	2
	r≤1	4.412207	4.412207		
No Co-integration between FII & Industrial Production Index	r=0	76.28224	52.15628	Yes	2
	r≤1	24.12595	24.12595		

Source: Author's own calculation

6.7 Panel Regression

Table 15 is showing the panel regression results of FDI & FII on independent Variable Industrial Production Index in BRICS' nations. It has been observed that the coefficient of FDI and FII, is 2.5110 and 2.2750 respectively, with p values 0.0000 for the coefficient. They are showing an overall positive impact of FDI and FII on production by industries in BRICS' economies. The results are found to be statistically significant. R-square and adjusted r-square is coming out to be 32% and 19% for FDI and FII respectively. F-statistics is noted as 9.4815 and 8.2148 with p-value 0.0000 which is less than 0.05. The values of adjusted R-square and F-statistics indicated about data and model fit.

Table 15: *Results of equation 1 & 2 through Panel Regression*

Particulars	**BRICS' (FDI)**		**BRICS'(FII)**	
	Coefficient	P-value	Coefficient	P-value
IIP	2.5110	0.0000	2.2750	0.0159
Constant	3.3228	0.0050	2.2037	0.0000
F-statistic	9.4815		8.2148	
P-value	0.0000		0	
R-square	0.3288		0.1922	
Adjusted R-square	0.3255		0.1909	

Following table 16 is showing the panel regression results of FDI and FII on independent Foreign Exchange Reserve in BRICS' nations. It has been observed that the coefficient of FDI and FII, is 1.1609 and 0.5822 respectively, with p values less than 0.05 for the coefficient. They are showing an overall positive impact of FDI & FII on exchange reserves of BRICS' economies. The results are found to be statistically significant. R-square and adjusted r-square is coming out to be 56% for FDI and 28% for FII. F-statistics is noted as 6.9956 and 6.3051 with p-value less than 0.05. The values of adjusted R-square and F-statistics indicated about data and model fit.

Table 16: *Results of equation 3 & 4 through Panel Regression*

Particulars	**BRICS' (FDI)**		**BRICS'(FII)**	
	Coefficient	P-value	Coefficient	P-value
FER	1.1609	0.0000	0.5822	0.0000
Constant	6.0419	0.0000	1.2525	0.0090
F-statistic	6.9956		6.3051	
P-value	0.0000		0.0000	
R-square	0.5680		0.2863	
Adjusted R-square	0.5659		0.2851	

Following table 17 is showing the panel regression results of the Industrial Production Index and Foreign Exchange Reserve on independent variable growth of BRICS' nations. It has been observed that the coefficient of IPI and FER, is 1.1298 and 0.8708respectively

with p values less than 0.05 for the coefficient. It is showing an overall positive impact of IPIand FER on Growth of BRICS' economies. The results are found to be statistically significant. R-square and adjusted r-square is coming out to be 75%. F-statistics is noted as 8.2310 with a p-value less than 0.05. The values of adjusted R-square and F-statistics indicated about data and model fit.

Table 17: *Results of equation 5 through Panel Regression*

Particulars	**BRICS' (GDP)**	
	Coefficient	P-value
IIP	1.1298	0.0000
FER	0.8708	0.0000
Constant	1.3994	0.0000
F-statistic	8.2310	
P-value	0.0000	
R-square	0.7543	
Adjusted R-square	0.7529	

7. Conclusion

Keeping the focal point of the study as to measure the impact of international investments on sustainable growth by measuring the effect first on industrial production and then on foreign exchange reserve which contributes to the sustainable growth of emerging economies BRICS', the different statistical tools that conducted hypotheses testing proved that all the null hypotheses of the study are rejected, and alternate hypothesis is accepted.

So, based on this validation these results further help in validating the model perceived for the study that has been adopted at the beginning of the study. Therefore, from the analysis of statistical results, it can be concluded that international investment positively impacts industrial production and foreign exchange reserve, which further contributes to the sustainable growth of the BRICS' economies.

8. Limitations

The study only takes into consideration two variables which are positively impacted by international investment, whereas there are several variables which might be relevant. Further, this study relies upon secondary data, and all of the constraints related to secondary data apply here. The time constraint of the study period has also to be considered as this paper works only on the recent ten years.

9. Scope for Further Research

Horizons of the research can be expanded with different economies and the same variable or different variables the same economies. Also, the study period can be broadened for adding up research instead of recent years taken up.

10. Implications of the Study

This study could be useful for all the world economies trading to expand further, and those economies, which are still restricting themselves, can consider evidence from it. This study is

also important for the world economic organisations and trading centres which promote sustainable development.

For all the investors across the globe, this article provides support for investing their money sustainably in the emerging economies. Emerging economies can also further motivate international investments for the better growth of their economies.

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