

Impact of FDI Inflows on Bilateral Trades between Brics Nations

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Abstract:

The study aims to demonstrate the trends and prediction of FDI inflow and identifying the relationship between FDI inflows with bilateral trades in BRICS nations. Descriptive research design is adopted to study the relationship between FDI inflows and bilateral trades considering the exports, imports and bilateral trades of ten years. It was observed that FDI inflows impacted Brazil and there is a negligible impact on other four nations. India is stable than other BRICS nations in terms of bilateral trades. This study helps to understand importance of FDI to create a better economy and analysing in which nation to invest.

Keywords: FDI, Bilateral Trade, BRICS, Panel Data, Forecasting.

I. INTRODUCTION

BRICS is home for nearly half of world's population, representing one fourth of planet's land mass (XI). In 2001 when South Africa was not included, the report of Goldman Sach's projected advancement in terms of economic growth. Aligning with this view, BRICS participation has been increased by 100% in global exports between 2001 and 2011. In eleven years, total exports have increased by 500%, whereas global exports increased by 195% in the same period. Between 2002 and 2012, intra-BRICS trade has increased by ten times, while between 2010 and 2012, BRICS' international trade increased by one-third from US\$ 4.7 to 6.1 trillion dollars. (XXXIII)

Evidence of trend shows that BRICS nations are rapidly developing through enhancing technological capability, improving infrastructure, deliberately providing innovative ways to abuse resources to increase the overall productivity by collective trading network (XXVII). In other words, uniting BRCIS have opened door to enlarge their trade,

monetary income, technical advancement to support development with cooperation (XXXII). However, increase in Trade not only beneficial to earn more but also give rise to challenge requirement of abundant capital inflow. To solve the problem of capital inflow foreign investment is essential for mutual development. BRICS endorses constancy in investment which helps in mitigating global depression in prevailing financial crisis (XVIII) and trade and investment Thus, Foreign direct investment (FDI) is among the most important economic measure which acts like an active catalyst for growth as well as development.

The economy of the world has been increasing with the rising volumes of international trades. However, many countries faced slow growth and not have an impact over. Therefore, BRICS aims at reducing the gap between the demand and supply by emendating the manufacturing space to strengthen the relation among them. In line with this, BRICS nations provides platform to promote foreign investment flow by simplifying trading mechanism

among nations. Hence, inflows through foreign investment played a major role to increase international and bilateral trades among the BRICS nations. While the bilateral trade helps in overcoming the cultural and economic gap to all the economies. Thus, the objective of the study is to investigate the bilateral trade agreement and the inflow of FDI to expedite development of BRICS nations by considering imports and exports of them.

II. LITERATURE REVIEW

The concept of BRIC Brazil, Russia, India and China was coined in 2001[XXV], after a decade South Africa joined the league giving raise to BRICS. South Africa hosted the 5th BRICS summit in Durban in 2013 [X]. In this summit the proposals were made for setting up of a development bank. BRICS nations account about 43% of global population, 18% of the world trade is from BRICS. [XI]

Other than the global governance issues, entanglement of South Africa in the BRICS has also been seen boosting the group's importance to the sub-Saharan African continent. According to this view, there is a rising importance against the traditional North-South model. [XV]

Inclined South Africa's involvement and the notion in some quarters break into positively overall SSA, this study attempts to show the BRICS nations trade relations which are crucial for South Africa and the other BRICS nations as well. It is essential to remember that most of the studies on BRICS focused majorly on other nations excluding South Africa. Trade and FDI are the two important drivers for BRICS economies [XXIX].

Couple of researchers in past, have included only original BRICs, excluding South Africa as the country joined the BRICs group in 2011 [VI; VII; XXXI]. While some of the previous studies dwell on the trade relationship among BRICS nations, whereas some focused on the relationship with other less income countries [III; XXVI]. The trade relations between BRICS and other part of the world has been

increasing significantly along with the world's largest and fastest developing economies China and Brazil. China ranked 3rd in the world based on global inflow of foreign investment in 2009. To get the benefit of cheaper labour, vast market size maximum multinational companies (MNCs) have changed their business operations to China [XXXIII]. In order to get the accurate trend of FDI it is significant to consider the past status of India's FDI which will show the stand point among rest of the BRICS nations [XXII].

Several studies have made attempt to scrutinize the role of economics, political factors, huge market and institutional in attracting FDI in BRICS economy [XXIII; XVI; XXI; XXX, V]. The multinational companies increased, and this paved the path to increase capital inflows and outflows. The investment acknowledged from other countries cater diverse benefits to the both the receiving and investing countries. Direct and indirect networks help in boosting the growth rate. Managerial know-how, domestic savings, allocation of risks, transfer of the technology is some of the examples of direct networks [XVII]. To encourage the FDI inflow, market size is one of the important parameters which can be considered. The crux of Foreign Direct Investment is crystal and favourable in the distinct future, but the FDI effect differs from each country. The policies of trade affect the performance of FDI in country's economic growth.

The FDI inflows to BRICS started from the year 2003 starting from \$77 billion, where China and Russia accounted for a biggest slice of growth. Foreign Direct Investment to BRICS endured relatively to withstand or recover quickly from difficult conditions, with a decrease in FDI inflows by 30% in 2009 (where as it was 40% for developed countries) and a rapid improvement to peak levels. As a result, Foreign Direct Investment to BRICS kept rising and even at the time of crisis FDI recorded of 20% in 2012. GDP (gross domestic product) and per capita GDP are the two major determinants for FDI inflows among the nations. [XXXIV] FDI has a constructive and advantageous

impact in long span but the event is unlike for each nation.

FDI provides various benefits to the countries in terms of more exports, increase in growth level, exorbitant wages and the accessibility of high end technology that helps in increasing the efficiency of local organizations. FDI is a continuous process where economies of the world together bring an enormous variation by enterprises which are highly striking now and has great yield [XIX].

FDI has encouraged the economic growth in market and promotes a dominant source from the MNCs for underlying accelerated projects globally. Several researcher pageant that relationship between FDI, commerce and growth of economy between the BRICS economies are not adequate. FDI widens the capital aggregation by recommending different inputs and technology. (VIII, I, IX, IV). Several researches explain the influence of FDI in economic development. (XX). Nations with favourable monetary structures and money market modulations can achieve FDI accurately and attain a superior growth rate. There is a positive alliance between growth of economy and FDI yet acclaim that nation should have extensive progress in procurement which supports derived perks of greater productivity. However, there also prevail the counterapproaches that forecast FDI in the companionship of established trade, finance, value and other disputations will cut source distribution and stagnant growth. Variables such as acceptance of economy, wages, framework, human capital, macroeconomic determinants, natural wealth (natural resources), cohesion (inflation) are the considerations of FDI flows. Research's observed that the size of market and the rate of inflation are certainly connected, and the parameter which adversely inducing the FDI flows is percentage of wage. Kowalski, 2009 has said that the collision of trade globalisation on economic growth in South Africa created a firm impact of liberalization of trade on development. The importance of BRICS' has surged up in recent years since the economic crisis. There is no particular approach of FDI which can be interpreted,

it was only initiated after the Second World War when globalization materialised in the world. There are several studies which centre on aspects that are affecting the flow of external capital in the emerging economies.

FDI has been attracting by BRICS countries since last twenty years. Foremost FDI beneficiary country among the BRICS nations was Brazil till 1984, China overtook this in 1985 and from that period China is continuing to be a main holder and a part of FDI, especially in the consumer durables and automotive industry. The important factors to attract FDI in BRICS countries are international liquidity, inflation rate, proportion of debt and export percentage in current account, fraction of GDP, unemployment ratio in the country, and financial plan balance as a section of GDP [XIV]. As per the survey, the aggregate export and import value of BRICS countries is amounted to be USD 2902801 and USD 2339183 million respectively in 2016. China has stood as the largest trading country in terms of both imports and exports among BRICS nations and in the world.

Inflow of FDI in BRICS can be divided into two groups of countries; first manufacturing (China and Brazil) and energy sector (Russia) focused countries and services sector focused countries (India and Russia) comes in second group [XXVII]. Due to emphasis on communication and information India and Russia considered service sector focused countries. In this segregation China and India comes after Russia, Brazil and South Africa. For example, India attracted highest investments among all in the beginning of 21st century due to introduction of country's economy towards the global market. The high progress of BRICS countries has been recorded as a significant section of global fiscal growth before the financial crisis of 2008. However, this financial crisis didn't affect BRICS members to that extent. Due to the crisis the export and import reduced to 65% in Russia, 52% in Brazil, 41% in China, 32% in South Africa and 23% in India. When compared it with G-7, the world economic crisis has not much

impacted BRICS countries in case of trade. When we compare with other developing countries economy of China continued to increase by (8 percent per year). [XIX]

From the above literature we can see that there are many studies which have found that FDI inflows and growth of economies, FDI inflows and GDP, FDI inflows and trade, FDI inflows and inflation, growth and development factors. But there is dearth of research on impact of FDI inflows on bilateral trade among BRICS nations. Thus, our study proposes to find the relationship between FDI inflows and bilateral trade by including exports and imports as input variables of FDI. [XXVIII]

In conclusion, the literature review on the BRICS says that there has been a discrete focal point in the available studies. This study focuses on South Africa and its trade relationships with the other BRIC nations.

From the above review of literature, the objectives of the present research are

- The objective of the research is to study the current patterns of trading with a view of development context.
- To see how the imports and exports have an impact on bilateral trade among BRICS nations.
- Determine the relationship between FDI inflow and bilateral trades

III. METHODOLOGY

This study begins with describing the relationship between FDI inflows and bilateral trades between BRICS nations, thus it designates the trade relationship between these countries which carries the characteristics of descriptive design. Apart from the descriptive design this research includes predictive analysis as well to forecast the FDI inflows of all the BRIC nations to encourage bilateral trades. Such trades can happen between any two countries, but we have considered BRICS nations in our study. The reason behind taking sample of BRICS nations is that, they are fastest growing economies of the world and all these nations have entered in an agreement to get benefits

by doing trade across the five nations. This helps us to understand and interpret the FDI inflows and the effects of the inflows on bilateral trades. This research incorporates secondary data from World Bank, WTO and comtrade.un.org. The study includes the data of FDI inflows in bilateral trades of BRICS nations. Thus, we have collected 10 years of FDI inflow data from 2006 to 2016 and to measure the recent trends we have forecasted the same for 2017 and 2018. The dependent variable for all the nations in this research is FDI inflows in current INR and the independent variables which will determine the flows of FDI are selected from former literature and dataset availability for a nominated period. The independent variables are exports and imports. The dependent variables are bilateral trade are taken from World Development indicators in all the five countries. The collected data is analysed through time series analysis, forecasting and panel regression by using SPSS and E Views tools. Time series analysis helps us to understand the trends of inflows over a period.

IV. DATA ANALYSIS AND INTERPRETATION

To check the time series property of the FDI of BRICS Nations, the most appropriate unit root test is conducted to check the stationary of data by augmented dickey-fuller test. The test has shown that the FDI inflows are stationary on first difference except China's FDI inflows. As given in table-1, the significance values of Brazil (0.0282), Russia (0.0252), India (0.0445) and South Africa (0.0200) is less than 0.05 (5%) so it is stationary whereas the significance value of China (0.1130) is greater than 0.05, so it is not stationary.

Table-1 Augmented Dickey-Fuller (ADF) Test

Country	Statistics /Values	t- statistics	Probability
Brazil	Augmented Dickey-Fuller test statistic	-3.667193	0.0282
	Test critical values:	1% Level -4.420595 5% Level -3.259808 10% Level -2.771129	
China	Augmented Dickey-	-2.684926	0.1130

	Fuller test statistic			
	Test critical values:	1% Level 5% Level 10% Level	-4.420595 -3.259808 -2.771129	
India	Augmented Dickey-Fuller test statistic		-3.342774	0.0445
	Test critical values:	1% Level 5% Level 10% Level	-4.420595 -3.259808 -2.771129	
Russia	Augmented Dickey-Fuller test statistic		-3.845496	0.0252
	Test critical values:	1% Level 5% Level 10% Level	-4.582648 -3.320969 -2.801384	
South Africa	Augmented Dickey-Fuller test statistic		-4.028277	0.0200
	Test critical values:	1% Level 5% Level 10% Level	-4.582648 -3.320969 -2.801384	

Source: Author's estimates.

After checking the stationary by ADF test table two specifies the model description which is been used to forecast the values of FDI for BRICS nations. While running the time series analysis in SPSS, export modular has dynamically nominated the respective models like Holt, Simple and ARIMA. Holt-Winters is one of the algorithms that is used to forecast data points in a series, the condition for this is the series should be seasonal, i.e. it should be repetitive in nature.

Table 2: Model description

	Model Type
Brazil model_1	Holt
China model_2	Simple
India model_3	Arima (0,0,0)
Russia model_4	Arima (0,0,0)
South Africa model_5	Arima (0,0,0)

Source: Author's estimates.

By using following formula Holts model forecasts the values of the given FDI inflows, $I_t = \beta \frac{y_t}{S_t} + (1 - \beta)I_t - L$ here, in case of Brazil Holt models fits best which forecasts the seasonality of data along with time. Thus, by running the model in SPSS, it has taken Holt winters forecasting model to project the inflow of FDI in Brazil. Simple exponential smoothing is used for forecasting data with no trend or seasonal pattern. In our research, SPSS has nominated this method to forecast the data of China. The following formula has been used to forecast the data $Y^{T+h|T} = \sum_{t=1}^T y_t, y^{T+h|T} = \sum_{t=1}^T y_t$. ARIMA (Autoregressive Integrated Moving Average Method) is a forecasting technique which projects the future values of a series entirely based on its own inertia. The following formula is used to forecast the data $Y = \beta_0 + \beta_1 X_1 + \dots + \beta_n X_n = \sum_{i=1}^N \beta_i X_i = X' \beta$. The mode can be implemented in short term forecasting using forty historical data points. In our research, SPSS has appointed ARIMA to forecast the data points of India, China and South Africa.

Trend Analysis

From the below graphs we can notice that FDI inflows in Brazil started increasing from the year 2009 and reached the highest point in 2012 later there is a down fall. The recent trends show that there will be a raise in FDI inflows in the near future.

Table 3: Forecast

Model	2017	2018
Brazil_model_1 Forecast UCL LCL	9.90E+0.10 1.49E+011 4.89E+010	1.05E+011 1.55E+011 5.43E+010
China_model_2 Forecast UCL LCL	1.82E+011 2.97E+011 6.63E+010	1.82E+011 3.33E+011 3.00E+010
India_model_3 Forecast UCL LCL	3.30E+010 5.23E+010 1.38E+010	3.30E+010 5.23E+010 1.38E+010
Russia_model_4 Forecast UCL LCL	4.40E+010 8.85E+010 -430418215.2	4.40E+010 8.85E+010 -430418215.2
South Africa_5 Forecast UCL LCL	5.00E+009 1.15E+010 -1527175400	5.00E+009 1.15E+010 -1527175400

Source: Author's estimates.

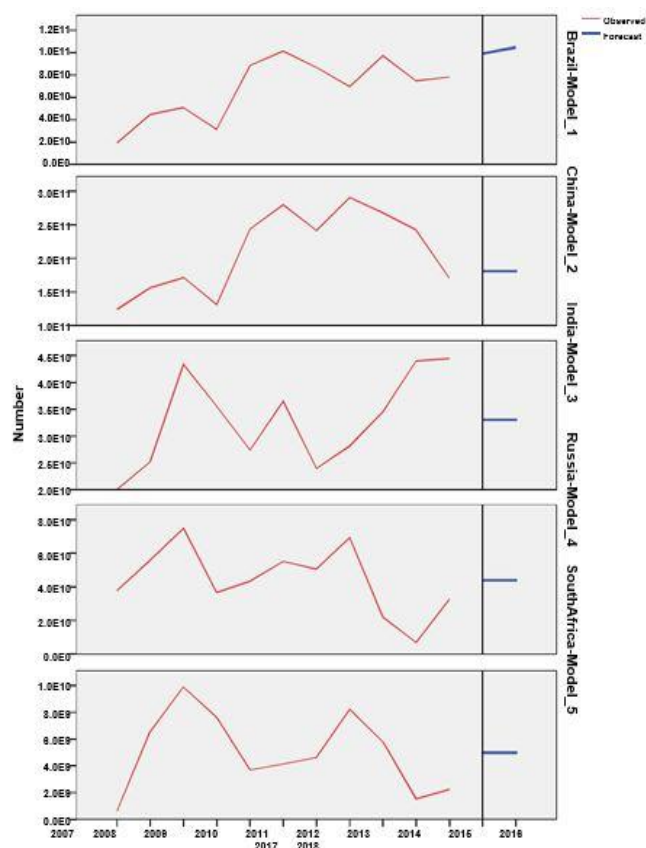


Figure 1: Trend Analysis

Source: Author's estimates.

China shows the similar trends like Brazil, but from 2015 we can see the down trends. The trends of inflows for India are showing a constant raise till 2009 and later there are a steep fall. From 2013 we can see that there is a constant increase in the inflows and the Arima tool predicts that in the near future FDI inflows remains more or Less the same considering the recent past. Russia has seen the increase in FDI inflows from 2015 and the Arima tool also predicted that soon there will be no major fluctuations in the inflows. South Africa has seen a steep increase in inflows till 2008 and later there were fluctuations. The recent trends show slow increase in inflows and the Arima tool also predicted that in the near future the trends remain same. The common point among India, South Africa and Russia is that the inflows increased at a steep rate till 2009 and later fluctuations occurred. Only India has seen a constant raise in inflows. Brazil and China have showed similar trends till 2012.

From the above data, we can see that Brazil will be more dependent upon the FDI inflows in 2017 depending upon the mean value and in the year 2018 Brazil will be the lowest dependent country on FDI inflows. For China the mean is same for both the year i.e. 2017 and 2018. This says that there will be no significant changes in FDI inflows which affect the economy of the country. Though there are some changes in UCL and LCL, the mean is not changing which means the fluctuations in UCL and LCL are negligible. When it comes to India, Russia and South Africa, the mean value, UCL and LCL are same for both the years which mean that the FDI inflows have same trends.

Panel Data Regression

Using EViews tool panel data regression has been conducted in this study. This has been done to get a clear picture of relationship between dependent and independent variables. Aligning the purpose of study, independent variable consists of Export and

Import data which is considered as FDI Inflow and dependent variable is bilateral trade with each BRICS economy. To identify the country wise strength and relationship between trade agreements and inflow of Foreign Investment.

Table: 4 Correlated Random Effects - Hausman Test

Country	Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.	Model	Remarks (Null Hypothesis)
India	Cross-section random	25.923204	2	0.0000	Fixed Effect	Rejected
South Africa	Cross-section random	0.978854	2	0.6130	Random Effect	Accepted
China	Cross-section random	2.998236	2	0.2233	Random Effect	Accepted
Brazil	Cross-section random	3.196920	2	0.2022	Random Effect	Accepted
Russia	Cross-section random	0.051741	2	0.9745	Random Effect	Accepted

Source: Author's estimates.

The above table shows the fixed and random effect regression for a period of 10 years (2006-2007). Panel data regression test is used to check the estimation of impact of bilateral trade on FDI inflows in BRICS nations. To make a choice between fixed or random effects model, we have applied Hausman test. Based on the Hausman test we can conclude whether fixed effect regression or random effect regression is applicable for the

selected model. From the above tables we can see that the effect of India (0.0000) is Fixed whereas South-Africa (0.6130), China (0.2233), Brazil (0.2022), Russia (0.9745) are showing Random effect. When the probability value is Less than significance Level i.e. 5% or 0.05, we reject the Null hypothesis and when it is more than significance Level, we accept the Null hypothesis.

Table 5: Fixed Effect

Country	Variable	Coefficient	t-Statistic	Prob.	R-squared	Adjusted R-squared	F-statistic	Prob (F-statistic)
India	C	- 6.904426	-4.045496	0.0002	0.977118	0.974108	324.5437	0.000000
	Exports	1.179088	4.020108	0.0003				
	Imports	1.354900	16.23482	0.0000				

Source: Author's estimates.

The Hausman test shows that fixed effect regression method is applicable for the observations which we have taken for India. Thus, we have used fixed effects regression model to estimate the results.

From the outcome of the model we have found that the impact of import and export on bilateral trade is significant at 5% Level in other words its explaining the impact of export and import on bilateral trade. In

the above table we can see that the coefficient values of exports (1.179088) and imports (1.354900) are almost similar and have greater impact on bilateral trade. The R-squared value (0.977118) is showing strength between imports – exports and bilateral trade. F – Statistic (324.5437) is showing

the relationship between the variable. From the value we can see that the samples of exports and imports are different and the P- value of F-statistics is showing it's significant.

Table 6: Random Effect

Country	Variable	Coefficient	t-Statistic	Prob.	R-squared	Adjusted R-squared	F-statistic	Prob (F-statistic)
Brazil	C	-0.000237	-0.018334	0.9855	0.999994	0.999994	3523360	0.000000
	Exports	0.993317	365.7727	0.0000				
	Imports	1.008646	297.4599	0.0000				
China	C	-0.491962	-0.914108	0.3660	0.997066	0.996923	6967.499	0.000000
	Exports	1.017382	69.42241	0.0000				
	Imports	0.993473	68.06487	0.0000				
Russia	C	-0.057491	-0.817100	0.4186	0.999880	0.999874	170354.1	0.000000
	Exports	1.008642	72.98239	0.0000				
	Imports	0.994720	105.8500	0.0000				
South Africa	C	0.008123	0.650558	0.5190	0.999946	0.999944	381390.1	0.000000
	Exports	1.005783	121.6448	0.0000				
	Imports	0.996003	180.8923	0.0000				

Source: Author's estimates.

The outcome of Hausman test shows that Random effect regression method is appropriate for the selected observations for Brazil, China, Russia and South Africa. The probability values of Brazil (0.2022), China (0.2233), Russia (0.9745) and South Africa (0.6130) which we have got from the outcome of Hausman test are higher than significance level i.e. 5% or 0.05, due to which null hypothesis accepted. This acceptance of null hypothesis shows that Random effect regression is appropriate. From the above table we can see that the coefficient value of Brazil's exports (0.993317) is less than its imports (1.008646), these values shows that Brazil is more of an importer country. Whereas other country's coefficient values show they are more depend on their exports. Among these four countries the export coefficient value of china i.e. 1.017382 is higher than other three countries. It means among all BRICS countries China is main exporter and it works as an influencer for other country's trade. From the above table we can see that the R-squared value which is showing the

strength between bilateral trade and FDI inflows is very high. As the F-statistic probability is showing zero, which means it highly significant.

V. DISCUSSION

Present research has taken BRICS nations for our study because India, Brazil, Russia, South Africa and China are the largest emerging markets. Before forecasting the trend of FDI inflow we have tested the stationarity by conducting Unit root test (ADF) which shows all BRICS nations FDI is stationary except China. While analysing the trend of FDI inflows South Africa, India and Russia are showing very similar trend but Brazil and China have given different trend. The forecasted values show upward movement in case of Brazil while other BRICS nations shows stable trend. The study found that there is a huge gap between the trends and forecasted values of brazil and china because China has a huge manpower along with better production and

manufacturing technique which Leads to higher exports. The lower limit of China is highly deviating, it is because the exchange of tariffs between US and China, which gives an impression of trade war. Due to this the FDI inflows of China is showing a fluctuating trend. Brazil is also showing different trend because it passed through economic crisis since past three years.

In order to measure the strength of the relationship between FDI and Bilateral trade Panel data regression is used. To select the model among fixed and random effect, the Hausman test is applied. The result of our study shows that fixed effect model is applicable in India, which means FDI inflow and bilateral trade shows equal means of observation. Because economy is steadily growing since last few years which shows stagnant inflow of FDI and trade agreements. Except India, in other BRICS nations like Brazil, South Africa, Russia and China depict the fluctuating relationship between FDI inflows and bilateral trade. Thus, other four countries show the individuality or heterogeneity. Therefore, the relationship between them is not showing significance change over a period of time. The reason behind such fluctuations in case of China is that they have the higher production. Whereas Brazil has passed through economic crisis over the past three years. Political instability as well as experienced market fluctuation which are the main reasons that South Africa faced. while coming to Russia, it has suffered financial crisis during 2014 to 2017.

VI. CONCLUSION

The present study contributes to understand the prominence of FDI in economy to enhance the bilateral trade agreements with other nations. This research explores the relationship between foreign direct investment (FDI) inflows and bilateral trade of five most emerging economies of the world is determined. The present study identified the prevailing FDI inflow pattern through time series analysis which has given mixed results. Brazil and China show fluctuating trend while India, South Africa, Russia shows stable trend. while considering relationship between FDI inflows and bilateral trade India is most stable economy than other BRICS

nations. In line with this to encourage more bilateral trade and lucrative investment, India is most appropriate destination for foreign investor among all other BRICS countries. The limitation of the study is time span, which can be expanded by incorporating longitudinal analysis. Future studies may consider other variables of FDI and bilateral trades which has been not included in present study. The comparative analysis between BRICS nations and underdeveloped or developed economies can be explored in future.

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