

What Drives Foreign Direct Investment to BRICS?

Mumtaz Hussain Shah* & Zahid Ali†

Abstract

This study explores the factors that drive foreign direct investment (FDI) to India, China, Brazil, South Africa and Russia that are called as “BRICS” collectively. Employing random effect panel estimation technique on panel data for the years 1990-2011, the study found that market size, trade openness, GDP growth rate, macroeconomic stability and infrastructure availability are essentially the key location factors for overseas investors. While, WTO accession has an insignificant impact on FDI in BRICS.

Keywords: FDI, BRICS Countries, Market Size, Trade Openness, Macroeconomic Stability

Introduction

Trade and investment are considered key components of a country's economy (Shah, 2009). Globalization facilitates international trade in many ways. Foreign Direct Investment (FDI), through universalising industrial production, plays an important role in this regard. Rapid increase in FDI flows across national borders in the last three decades clearly indicates the pace with which the world economy is globalizing (UNCTAD, 2006).

UNCTAD (2011) says that FDI involves a durable association, showing the long-term commitment and control of a foreign resident in the local economy. FDI can shape the production, price, general welfare, development and economic growth of the host country. Also, through FDI transfer of advance technologies takes place (UNCTAD, 2003). Consequently, it can be said that FDI at times is instrumental in developing the newly emerging economies.

In last couple of decade's the geo politics, commerce, trade, investment, economics and the organisation of production processes globally has experienced a great worldwide change (Rajan, 2009). These changes have brought countries such China, South Africa, India, Brazil and Russia on the central stage of the world economy in terms of international manufacturing of goods and provision of services (Shah, 2015). These countries do not have any trade union; however they are listed as emerging economics due to their vast population and enormous consumer market. The term BRICS comes under an umbrella covering these five fast emerging economies as an 'economic block' that was first coined by Goldman Sachs Investment Bank.

* Institute of Management Studies, University of Peshawar

† Institute of Management Studies, University of Peshawar

The member countries of BRICS share certain common characteristics, such as, large population, fast economic growth, potential consumer market etc. attracting a great number of investors from all over the world. According to International monetary Fund (IMF, 2009) BRICS countries together represents 24% of world GDP. Cheng and Kwan (2000) said that by the middle of the twenty first century the combined economy of the BRICS nations would become a dominant global economic player. According to the prediction of Goldman Sachs, India and China are expected to dominate the world market for providing services and in supply of consumer goods. Russia and Brazil will emerge to lead the global market for supplying raw materials to the rest of the world. BRICS had the nominal GDP of about 11 trillion US dollars in 2010 and based on it they are termed as the five leading world emerging economies.

United States financial crisis of 2008, due to subprime mortgage has pulled the global market into worldwide financial market crunch but BRICS appears to be better placed as the down turn was relatively weaker over there. Though, a short term sudden decline in FDI inflow was recorded (UNCTAD, 2011); however BRICS appear to be well positioned for the global economic downturn, unlike US and many other countries. According to the newly prepared GDP growth projections, IMF has noticed an amazing BRICS growth path. These five economies together accounts for a 48.3% share of global GDP growth in 2000-2008, whereas compared to them Group of seven commonly known as “G7” nations contribution is only 20.8%. Why are the BRICS countries attracting more FDI? And most importantly how? Last but not least, will BRICS countries continue with the increasing trend of receiving FDI? These points are not fully concluded and need further theoretical and empirical perspectives.

The existing literature on the factors that drives FDI is quite rich. Many case studies and surveys have been conducted in this regard (Dunning, 1973, Agarwal, 1980, Bevan & Estrin, 2002, Moosa, 2002 and Sahoo, 2006 etc.). However, neither of these studies has addressed emerging economies for the time period of 1990-2011 and the present literature relating to BRICS economies is still very limited. Under this perspective the current study intends to determine the factors driving FDI into the five big emerging countries. Through random effects panel data estimation technique for the time period of 1990-2011 the aim of the study will be to make an effort to provide a comprehensive empirical analysis.

Research Question

What are the primary factors responsible for driving FDI into “BRICS” countries? Among these factors which ones are more significant and which ones fails to make any significant effect on inward FDI inflows to these economies.

Research Objective

The principal objective of the research paper is to examine the location factors which drive FDI into BRICS countries by making use of random effect panel data regression model for the time period 1990-2011.

Structure of the Study

After introduction the remaining paper is structured in the following order: part 2 is about literature review, in 3 the variable description and hypothesis formulation is given. 4 is about the research methodology and data analysis is given in part 5. Section 6 is about the results and interpretation and the 7th concludes the study.

Literature Review

Numerous theories and past empirical research studies exist which elucidate the causes and reasons for multinational investment decision. Contemporary researchers of the subject can deduce the primary factors driving foreign direct investors. At the same time they highlight the issues deterring the investors or creating hindrances for them. The foundations of the research work on FDI determinants mostly depends on the path setting Ownership, Location and Internalisation (OLI) paradigm of John Dunning (Dunning, 1973 and Dunning, 1981). The OLI theory gives an in detail structure of multinational overseas investment activities. The OLI paradigm is used extensively by the Multinational Enterprises to operate beyond their native boundaries.

A thorough study of the existing literature on FDI determinants categorizes the potential determinants of FDI into three groups that are social factors (real wages, infrastructure level, and education level), economic factors (size of the market, macroeconomic stability, trade openness and real exchange rate) and the political factors (bureaucratic quality, domestic legal framework and a country's risk perception).

To analyse the potential determinant of FDI in emerging economies Duran (1999) using time series and panel estimation methods for the time period 1973-1981, concludes that market size, GDP growth, trade openness and macroeconomic stability considerably influence FDI. Cheng and Kwan (2000) assessing probable FDI determinants in 28 Chinese regions for 1986-1996, found that good infrastructural availability, size of regional market and preferential trade and investment policies positively effect FDI, whereas, wage rate negatively effects FDI.

Asiedu (2002), in order to explore the factors driving FDI to the developing nations affect Sub Saharan African countries similarly or differently used Ordinary Least Square estimation for the years 1988-1997. She found that return on investment (ROI) and the infrastructural availability profoundly attracts FDI in non-Sub Saharan African countries, but interestingly these two variables have not any statistically significant rapport with FDI in Sub Saharan African countries. However, trade openness has a significant relationship with FDI in both Sub Saharan and non-Sub Saharan African countries. Investigating what drives FDI to the European transition economies, Bevan and Estrin (2002) using panel data estimation techniques found that labour cost and market size have a substantial bearing on FDI while the study is unable to find any statistically significant relationship between country risk and FDI. Moosa (2002) found that political stability of a country is greatly affecting FDI. Political risk or instability in a country will lead to a decrease in FDI. Shah and Afridi (2015) found the same results. Political risks are riots; governmental takeover of land and properties, operation restrictions etc. and

these are not only badly affecting business activities but also hindering FDI (Shah & Faiz, 2015).

Nunes, Oscategui & Peschiera, (2006) studied the determinants of FDI in Latin America from 1991-1998. Using fixed effect panel data technique their work concluded that market size; infrastructure quality and trade openness significantly affect overseas investors decision. While wages rate and inflation rate negatively influence their investment choice, whereas privatization had no significant impact on FDI. Shah (2011f & 2012b) also found infrastructure to be highly important for multinational firms' overseas investment decision. Mixon (2007) analysed the former socialist countries of eastern and central Europe to determine the factors influencing FDI over there. Using panel data estimation for 1995-2004, the study finds that exchange rate, trade openness and government deregulations have statistically significant effect on FDI. Exploring Chinese WTO accession impact on foreign direct investment, Hong (2008) found that WTO membership is meaningfully affecting FDI.

Vijayakumar, Sridharan, Rao & Chandra (2010) studied the determinants of FDI of BRICS countries from 1975 to 2007. By employing the panel data estimation techniques they concluded that market size, labour cost, gross capital formation and infrastructure facilities of the host countries are the potential determinants of FDI. While inflation rate measuring economic instability, growth prospects of the FDI host economy proxied through industrial production index and openness of the business regime fails to make any significant effect on FDI. Azam (2011), using ordinary least square regression from the period of 1992 to 2010 found that rate of inflation, domestic market size, preceding time period FDI and government assistance to development significantly affects FDI in Kazakhstan but not in Azerbaijan. Ullah, Haider & Azim (2012) employing unit root time series economic technique for the years 1980-2010 found that exchange rate depreciation and trade openness positively affects FDI in Pakistan. Examining economic, political and social factors influence on inward FDI in three SAARC member countries, that are, Bangladesh, India and Pakistan. Zafar (2013) through time series data for the years 1990-2010 found market size, real exchange rate and inflation to be the main economic determinants. Political instability turned out to be an insignificant determinant for India and Bangladesh.

Variable Descriptions and Hypothesis Formulation

The study found six potential determinants from the literature, that are, infrastructure level, market size, macroeconomic conditions, trade openness, growth prospects, human capital and WTO accession. They are briefly discussed here in this section one by one.

Market Size

Market size gives an indication of the host market overall size. Gross domestic product (GDP) of an economy or the population size of the country is usually used as a proxy for it (Shah, 2010). The literature manifest that larger the market, higher will be the incidence of inward FDI. Bevan and Estrin (2002) and Sahoo (2006) found that it positively affects FDI terming market size to be an important determinant of FDI; while

the study of Holland (1999) found an altogether insignificant rapport between FDI and market size.

Trade Openness

Trade liberalization is also one of the crucial FDI determinants as identified in the literature review. It is measured by the ratio of import plus export to gross domestic product (Shah and Samdani, 2015). Liberal trade policies attract more FDI and are usually expected to positively influence investors (Shah and Khan, 2016).

Human Capital

Human capital is an essential determinant of FDI. Multinational firms seek educated and skilful labour for production abroad. Literature exhibits mixed results for human capital as determinant of FDI (Shah, 2014a). Positive and statistically significant relationship was observed by Cheng and Kwan (2000), while, Banga (2003) found an insignificant relationship between FDI and human capital. In the current study we are using enrolment at the secondary level to measure human capital.

Macroeconomic Stability

Countries with stable macroeconomic indicators receive more FDI as compared to volatile economies. Investors will prefer to invest in the countries where there is certainty about macroeconomic condition as compared to ones where uncertainty is high (Mendonca, 2003). We have used inflation rate to measure the macroeconomic stability of the country and it is expected that higher inflation will lead to less FDI (Duran, 1999).

Infrastructure Quality

The development of a country mainly depends on the quality and availability of infrastructure facilities (Shah, 2014b). According to Shrestha (2003) infrastructure quality leads to a well-developed channel of roads, seaports, airports, telecommunication system and the supply of water and electricity. In this study we are using rail lines to measure the infrastructure quality and expect a positive relationship.

WTO Accession

A dummy variable (0, 1) will gauge the extent of influence WTO accession exert on FDI in BRICS countries (Shah, 2011b). 0 indicates non-members while 1 indicates WTO member countries. Ting and Cheong (2009) and Hanh (2011) found significant impact of WTO accession on FDI.

Research Hypothesis

After the brief descriptions of the variables the study formulates the following hypotheses that are to be tested.

1. **H₀:** Market size of host countries doesn't significantly affects FDI inflows
H₁: Market size of host countries significantly affects FDI inflows.

2. **H₀:** Trade openness of the host countries doesn't significantly affects FDI inflows
H₂: Trade openness of the host countries significantly affects FDI inflows
3. **H₀:** Human capital of the host countries doesn't significantly affects FDI inflows
H₃: Human capital of the host countries significantly affects FDI inflows
4. **H₀:** Macroeconomic stability of the host countries doesn't significantly affects FDI inflows
H₄: Macroeconomic stability of the host countries significantly affects FDI inflows
5. **H₀:** Infrastructure level of the host countries doesn't significantly affects FDI inflows
H₅: Infrastructure level of the host countries significantly affects FDI inflows
6. **H₀:** WTO accession of the host countries doesn't significantly affects FDI inflows
H₆: WTO accession of the host countries significantly affects FDI inflows

Research Methodology

This part provides a brief research methodology followed by panel data estimation techniques and model specification. Data collection sources are also given.

Research Paradigm

This research article explores the possible FDI determinants in BRICS nations. The approach of the study is deductive because it is based on hypothesis testing, and the data used in this study is quantitative, therefore this study is following the research philosophy of positivism. Saunders, Lewis and Thorn (2007) demonstrates that Positivism is a scientific approach of understanding a phenomenon on the basis of objectivism and empiricism. Positivism only believes on scientific knowledge, which can be perceived through five senses. In positivism researcher will always use methodology that is completely structured. The observations or data collected in positivism is quantifiable, so the nature of research in positivism is quantitative. In positivism mono-method data collection technique is used, which is only quantitative. The research starts with a hypothesis to check the cause and effect relationship, and on the basis of the empirical findings the null hypothesis is rejected or accepted. This study is also based on hypothesis testing followed by structured methodology, dealing with quantitative data. The data collection and analysis techniques are quantitative; therefore the only appropriate approach for this study is following positivism. A panel random effect regression method is utilised to find the association amongst the explained variable (FDI) and the explanatory variables (market size, trade openness, macroeconomic stability, human capital, exchange rate and WTO accession)

Research Approach and Strategy

This study uses the deductive research approach followed by hypothesis testing. The research objective is to find “what drives FDI to BRICS countries” and adequate availability of the previous studies helps to formulate the hypothesized relationship for examination. This study will use only secondary data sources and panel data statistical techniques will be used for analysing the data. As both the data collection and analysis techniques are quantitative, therefore the design of this study will be based on mono-methods research choices.

Population, Sample and Time Horizon

The population of the study includes all the emerging countries. But in this study we have taken the five fast emerging countries, namely South Africa, Brazil, India, China and Russia which as a group are known as “BRICS”. The data for these countries have been taken for the time period of 1990-2011.

Data Collection/Sources

Data for the current article is collected from secondary sources for BRICS countries for the years 1990-2011, except Russia. The data for Russia is available from 1994 onward. The data for all the variables except from the Human Capital (Secondary school enrolments) is taken from world development indicators (WDI) of World Bank (www.worldbank.org). The data for human capital is from Barro and Lee educational database (www.barrolee.com).

Model Formulation

Six independent variables that are market size, human capital, trade openness, macroeconomic stability, infrastructure level and WTO accession are included in the model. This paper analyses the possible effect of these six explanatory variables on the dependent variable (FDI inflow) in these emerging economies. In connection with the previous section the study proposes the following estimation model

$$FDI_{jt} = \beta_0 + \beta_1 \text{Market Size}_{jt} + \beta_2 \text{Trade Openness}_{jt} + \beta_3 \text{Human Capital}_{jt} + \beta_4 \text{Economic Growth}_{jt} + \beta_5 \text{Macroeconomic Stability}_{jt} + \beta_6 \text{Infrastructure}_{jt} + \beta_7 \text{WTO Accession}_{jt} + \mu_{jt}$$

By locating the appropriate dummies for the controlled variables and taking their natural log in order to linearize them, the final regression model is as given below:

$$FDI_{jt} = \beta_0 + \beta_1 \ln GDP_{jt} + \beta_2 \ln Trade_{jt} + \beta_3 \ln SSE_{jt} + \beta_4 \ln GDPPCG_{jt} + \beta_5 \ln Inflation_{jt} + \beta_6 \ln RailLine_{jt} + \beta_7 \ln WTOA_{jt} + \mu_{jt}$$

Here FDI stands for FDI inflows to the host countries. GDP stands for gross domestic product and is used for proxying market size. Imports plus export (aggregate trade) is used as proxy for trade openness. Enrolment at the secondary school level is used as a

proxy measure for human capital. GDPPCG is the gross domestic product per capita growth. WTOA is used for WTO accession or membership. μ is the error term.

Estimation Techniques

This study employs panel data estimation techniques. According to Greene (2003) regression models based on panel data has double subscripts on the variables to ensure the presentation of both the space and time dimensions. As panel data incorporates the cross sectional as well as time dimensions therefore it is a mix of the cross sectional data and time series (Gujarati & Dawn, 2009).

$$Y_{it} = \alpha_i + \beta X_{it} + u_{it} \quad \text{Where } i \text{ vary from 1 to } N \text{ and } t \text{ from 1 to } T$$

Panel data regression model has three different methods that we tried to use in this study that are (i) common constant (pooled effect or the ordinary least square model) (ii) panel fixed effects estimation technique and finally (iii) panel random effects estimation model.

Data Analysis

The econometric problems attached with panel data and how to deal with them is discussed here.

Descriptive Statistics

A summary of the primary statistics of the data gives information about the minimum and maximum values, mean, standard deviation and total observation used for all variables used in the regressions.

Table 1 **Summary of Descriptive Statistics**

Variable Proxy	Total No. of Observations	Arithmetic Mean	Standard Deviation	Lowest Value	Highest Value
LnFDI	106	24.75	1.54	19.02	27.29
LnGDP	106	27.08	0.94	25.43	29.62
LnTrade	106	3.65	0.44	2.76	4.32
LnGDPPGr	106	1.46	1.16	-2.60	2.72
LnRailLine	106	10.50	0.85	8.33	11.43
LnSSE	106	1.99	0.33	1.37	2.54
LnWTOA	106	0.58	0.49	0.00	1.00

Correlation

Correlation analysis is carried out in order to see or find out the linear relationship between two variables and how much they are correlated with each other (Shah, 2011a). The coefficient of correlation lies between the ranges of -1 to +1, indicating strongly negative and positive correlation respectively. Table 2 shows the results of correlation matrix.

Table 2 Correlation Matrix

No	Variables	a	b	c	d	e	f	g	h
a	FDI	1.00							
b	GDP	0.71	1.00						
c	Trade	0.17	0.01	1.00					
d	Human Capital	0.29	0.01	0.58	1.00				
e	Macroeconomic Stability	-0.35	-0.26	-0.25	-0.05	1.00			
f	GDP Growth	0.39	0.34	0.06	-0.21	-0.43	1.00		
g	Infrastructure Level	0.04	0.26	0.49	0.20	-0.37	0.23	1.00	
h	WTO Accession	0.33	0.22	0.05	0.22	-0.40	0.24	0.22	1.00

Heteroscedasticity

One of the assumption of the ordinary least square states that variance of the error term should remain constant (Homoscedastic). When error term doesn't remain constant then it causes the problem of heteroscedasticity (Shah, 2012d). If this problem arises then the ordinary least square parameters lose its properties of being BLUE (best linear unbiased estimator). Breusch-Pagan / Cook-Weisberg test for heteroscedasticity is used to detect the problem of heteroscedasticity. It checks the null hypothesis of homoscedasticity versus the alternate hypothesis which states that the error terms variance is not constant or heteroscedastic.

The result of the test (table 3) shows that the values of chi-square is sufficiently high, meaning that we can reject the null concluding that the problem of heteroscedasticity is there. To control for it the standard errors reported in the regression analysis are all robust to heteroscedasticity (Shah, 2011c).

Table 3 Breusch-Pagan / Cook-Weisberg Test

Chi square	7.04	Probability > Chi ²	0.000
------------	------	--------------------------------	-------

Multicollinearity

According to the assumption of ordinary least square there shouldn't be high correlation between the explanatory variables. Multicollinearity arises when this assumption is being violated (Shah, 2012a). When this problem is there then the OLS still remain BLUE but some adverse problems arise. The standard error are very high, the estimators become pretty sensitive to addition or deletion of some observations. Some important variables may turn insignificant. Also the estimators have wrong signs if the problem of multicollinearity is categorically high.

Table 4 VIF Results

Variables	VIF	1/VIF
LnOpenness	3.14	0.254939
LnSSE	2.66	0.178328
LnRailLines	2.24	0.173521
LnWTO Membership	1.84	0.641300
LnInflation	1.83	0.445468
LnGDPPCG	1.52	0.536254
LnGDP	1.44	0.409196

To measure the severity of the multicollinearity in the estimations we have used the “variance inflation factor” (VIF) and the “tolerance level” (1/VIF). If no correlation exists among the independent variables the VIF values will be 1. When the value of VIF gets above 10 and the tolerance level falls below 0.1, then this means that there is severe problem of multicollinearity. Below 10 is acceptable according to Asteriou and Hall (2007). Table 4 presents the values for variance inflation factor. The results indicate that there exist no problematic multicollinearity in the model as the value for VIF are below the standard value of 10 and the values of 1/VIF are greater than 0.1.

Hausman Specification Test

Random effect model is used in this study based on the result of Hausman (1978) specification test. It tests the null hypothesis H_0 : fixed effect and random effect estimators are both consistent but the random effect technique is efficient against the alternate hypothesis H_1 : random effect is inconsistent and fixed effect panel method is consistent and efficient (Shah, 2013a).

The result of Hausman test are “ $\text{Chi}^2 = 11.56$, Probability > $\text{Chi}^2 = 0.12$ ”. The probability value is clearly greater than the conventional significance level of 0.05. Therefore we are unable to reject the null hypothesis that random effect is efficient. Hence, we use random effect panel estimation technique.

Table 5 Hausman Specification Test

Chi square	11.56	Probability > $\text{Chi}^2(7)$	0.12
------------	-------	---------------------------------	------

Results and Interpretations

Here the empirical results of the random effect model are presented with brief interpretation of the results. Seven separate regressions have been carried out in order to reach the final estimation model. The R^2 (explanatory power) is increasing as we are getting close to our final regression model depicting the importance of the individual independent variables. The results of the final regression (Model 7) are interpreted here. The results are given in the table 6.

Market Size

Gross domestic product (GDP) is used to represent market size (Shah, 2011d); its coefficient is positive with a statistically significant relationship with FDI at one percent. This positive and statistically significant relationship indicates that for BRICS economies market size is one of the important FDI determinants. Therefore, we can reject the null hypothesis and conclude that from 1990 to 2011 market size has a significant impact on FDI. Studies done by Bevan and Estrin (2002), Sahoo (2006), Rajan (2009) and Shah (2011e) found the same results.

Trade Openness

Aggregate trade measures trade openness over here. Lntrade coefficient is positive and has statistically significant association with inward FDI at ten percent. The statistically significant and positive relationship shows that openness of trade regime is an essential FDI determinant in BRICS nations. Asiedu (2002) and Shah and Qayyum (2015) found the same results.

Human Capital

Secondary school education enrolment is used as proxy measure for human capital. LnSSE's coefficient is statistically significant at one percent and positive. The positive and significant relationship indicates the importance of human capital being a noteworthy FDI driver in BRICS countries. Cheng and Kwan (2000) used the same proxy to measure the human capital and got the same result. This result confirms that economies having skilled workers are more productive, thus causing increased FDI inflow.

Growth Prospects

GDP per capita growth rate is used as a proxy to measure the growth prospects in BRICS countries; the coefficient of GDPPC growth rate is positive and is significant statistically at five percent level. This endorses that investors continuously invests in those countries where they see the growth prospects for their invested capital. Agarwal (1980) and Mainardi (1992) found the same results.

Macroeconomic Stability

Inflation rate is used as proxy to measure the macroeconomic stability of BRICS countries. The coefficient of inflation rate is significant statistically at five percent and negative. This result indicates that higher inflation will cause lower FDI flows into the BRICS countries. Mixon (2007), Shah (2012c), Shah (2013b) and Zafar (2013) arrived at the same results.

Infrastructural Level

Railway lines are used as a proxy to measure the infrastructure level in BRICS countries. The affiliation amid infrastructure level and inward FDI is significant at one percent. This shows the prominence of infrastructure for inward FDI in BRICS countries. Earlier studies such as Kumar (1994) and Asiedu (2002) used the same proxy to measure the infrastructure level and found the same results.

WTO Accession

Dummy variable (0, 1) is used as proxy for WTO accession. The coefficient though, is positive, as expected, but insignificant at conventional statistical levels. This result points to the fact that WTO accession is not an imperative factor in BRICS countries until 2011. This insignificance may be due to the reason that the data taken for this study is from 1990 to 2011 but China and other countries become WTO members 2000 onward and Russia is yet to join WTO.

Table 6 Estimation Results Panel Random Effect Estimation

Variable	1	2	3	4	5	6	7
Market Size	1.5843*** (0.1196)	1.4651*** (0.1272)	1.2755** * (0.1427)	0.9878*** (0.1002)	0.9619*** (0.1053)	1.1531*** (0.0894)	1.1389*** (0.08924)
Trade Openness		0.8106*** (0.2696)	0.3000 (0.30873)	-.4857* (0.2583)	-0.5946** (0.2896)	0.4589* (0.2497)	0.4133* (0.2447)
Human Capital			2.2526** (0.7028)	2.0454*** (0.3215)	2.0826*** (0.3290)	1.5633*** (0.2399)	1.6261*** (0.2608)
Growth Prospects				0.3820** (0.1860)	0.3317** (0.1639)	0.3312** (0.1273)	0.3331** (0.1278)
Macro-Economic Stability					-0.1134 (0.0897)	-0.1984** (0.0641)	-0.1826** (0.0754)
Infra-Structure						0.8952*** (0.1351)	0.8621*** (0.1568)
WTO Accession							0.1402 0.2289
No. of Obser.	106	106	106	106	106	106	106
R-Squared	0.63	0.65	0.67	0.72	0.71	0.73	0.73

*shows significance at 10, **at 5 and ***shows significance at 1 percent level.

Overall Significance of the Model

R² showing the explanatory power of the model is 73 percent, which affirms that the last regression model including all the seven independent variables explains 73 percent of the variation in FDI. The remaining 27 percent change in the FDI is relegated to the error term. The value of Wald Chi square is 408 and the p-value is 0.000, which shows the fitness/significance of the model statistically to explain the variations in inward FDI.

Conclusion

The term “BRICS” brings under an umbrella the five rapidly growing emerging countries of the world, that are, Brazil, Russian, India, China and South Africa. These five fast expanding economies have the largest potential market and are therefore projected to draw more FDI inflows. Nonetheless, the factors that are inviting FDI to these emerging states have been researched sparingly. The present study has attempted to find the potential factors that are determining FDI to these countries from the period of 1990 to 2011.

By employing panel data regression model this study investigates the location factors influencing FDI into the BRICS nations. This study has tried all the panel data estimation techniques, that are, ordinary least square pooled method, fixed effect model and the random effect technique. Among them random effect model has been used in this study on the basis of Hausman specification test. Seven independent variables were included in the model that are GDP, trade openness, GDPPC growth, inflation rate, railway lines, and WTO accession.

Trade openness, infrastructure level, GDP growth and inflation rate are found to be the significant FDI determinants in BRICS. These findings points toward the fact that trade openness attract more FDI. Therefore, their governments need to adopt less restrictive trade policies to bring more FDI inflows. The market size also has a significant contribution while determining inward FDI. Large market has an advantage of economies of scale and supplementary investments opportunities that will lead to additional FDI inflows. GDP growth is also significantly determining FDI in BRICS countries because investors always want to invest where the growth prospects are high. Macroeconomic stability measured through inflation rate is also an important factor triggering FDI in these countries. WTO accession is found not to be an effective FDI pull factor in BRICS republics.

The main challenges for these countries now are how to endure their current performance and the trends in the FDI inflows and how to make policies to help them optimize local commercial environment for attracting more FDI. These countries have a promising future for overseas investors due to their large market size, high future growth prospects and availability of skilful cheap labour.

References

- Agarwal, J.P. (1980). Determinants of Foreign Direct Investments: A Survey, *Weltwirtschaftliches Archive*. 116, 35-37
- Asiedu, E. (2002). On the Determinants of Foreign Direct Investments in Developing Countries: Is Africa Different? *World Development*. 30(1), 107-119.
- Asteriou, D. & Hall, S.G. (2007). Multicollinearity. *Applied Econometrics*. Revised edn. Hampshire UK: Palgrave Macmillan, 85-99.
- Azam, M. (2011). Institutional and Macroeconomic Policy Factors on FDI: South Asian Countries Case. *African Journal of Business Management*. 5(11), 4306-4313.
- Banga, R. (2003). *Impact of Government Policies and Investment Agreements on FDI Inflows*, Indian Council for Research on International Economic Relations (ICRIER), working Paper No. 116, New Delhi, India
- Bevan, A.A., & Estrin, S. (2002). On the Determinants of Foreign Direct Investments into European Transition Economies, *Journal of Comparative Economics*. 32, 775-787.

- Cheng, L.K., & Kwan, Y.K. (2000). What are the Determinants of the Location of Foreign Direct Investment? The Chinese Experience. *Journal of International Economics*. 51(2), 394-400.
- Dunning, J.H. (1973). The Determinants of International Production, *Oxford Economic Papers*. 25, 220-225.
- Dunning, J.H. (1981). International Production and Multinational Enterprise, *Allen & Unwin*. 35, 149-66.
- Duran, J.E. (1999). Los Determinantes De La Ied En Los Países De América Latina Y El Caribe: Suimpecto Sobre El Comercio Y La Integración Regional, ECLAC, Mimeo.
- Greene, W.H. (2003). *Econometric Analysis*. 5th Ed. Upper Saddle River, NJ.
- Gujarati, D.N. & Dawn, C.P., (2009). *Basic Econometrics*. McGraw-Hill International Edition, 5th Ed., Boston, 260-261.
- Hanh., P.T.H. (2011). Does WTO Accession Matter For The Dynamics Of Foreign Direct Investment And Trade? *Journal Of Economics Of Transition*. 19(2), 255-285
- Hausman, J.A. (1978). Specification Tests in Econometrics. *Econometrica*. 46(6), 1251-1271.
- Holland, D. (1999). The Diffusion Of Innovations In Central And Eastern Europe: A Study of the Determinants and Impact of Foreign Direct Investment, *NIESR Discussion Paper No.137*, National Institute of Social and Economic Research, London.
- Hong, J. (2008). WTO Accession and Foreign Direct Investment In China, *Journal of Chinese Economic and Foreign Trade Studies*. 1(2), 136-147
- Kumar, N. (1994). *Multinational Enterprises and Industrial Organization*, Sage Publications, New Delhi.
- IMF. (2009). World Economic Outlook: Transitions and Tensions, Washington, D.C.
- Mainardi, S. (1992). Foreign Direct Investment in Latin America and Southeast Asia: Relevance of Macroeconomic and Policy-Related Factors. *Journal of Giornale Delgi Economisti*. 5(8), 259-79
- Mendonca, M. (2003). The Determinants of Direct Foreign Investment in Developing Countries, January, Working Paper, *Institute of Applied Economic Research*.
- Mixon, F. (2007). Foreign Direct Investments and Transition Economies: Empirical Evidence from a Panel Data Estimator” *Economics Bulletin*. 6(33), 1-9.
- Moosa, I.A. (2002). *Foreign Direct Investment: Theory, Evidence and Practice*, London: Palgrave.
- Nunes, C.L. Oscategui, J. & Peschiera, J. (2006). Determinants of FDI in Latin America. *Documento De Trabajo*, 252.
- Rajan, V. (2009). Determinants of Foreign Direct Investments Inflows to the BRIC Countries. *International Business Research*. 4(4).
- Sahoo, P. (2006). Foreign Direct Investment in South Asia: Policy, Trends, Impact and Determinants. *ADB Institute Discussion paper No*. 56.
- Saunders, M., Lewis, P. & Thorn H.A. (2007). *Research Methods for Business Students*. 4th ed. London: Prentice Hall.

- Shah, M.H. (2009). *FDI induced growth in developing countries: does human capital matter?* PhD Conference. 5th & 11th March, 2009. Economics Department, University of Leicester, Leicester, UK.
- Shah, M.H. (2010). *Bilateral linkages with OECD and FDI inflows in leading developing countries*. The Fifth International Conference on Interdisciplinary Social Sciences. 2-5 August, 2010. University of Cambridge, Cambridge, UK.
- Shah, M.H. (2011a). Bilateral linkages with OECD and FDI inflows in leading developing countries. *International Journal of Interdisciplinary Social Sciences*, 5(7), 255-270.
- Shah, M.H. (2011b). *Essays on foreign direct investment in developing countries* (Doctoral dissertation, University of Leicester).
- Shah, M.H. (2011c). *The effect of associations with OECD economies on FDI inflows in leading/emerging developing countries*. 4th Italian Doctoral Workshop in Economics and Policy Analysis. 7-8 July, 2011. University of Torino and Collegio Carlo Alberto, Via Real Collegio 30, 10024 Moncalieri, Torino, Italy.
- Shah, M.H. (2011d). *Networking with OECD economies, enhancing inward FDI in emerging developing countries*. 7th UK Social Networks Conference. 7-9 July, 2011. University of Greenwich, Greenwich Campus, Old Royal Naval College, London, UK.
- Shah, M.H. (2011e). *World Trade Organisation and inward foreign direct investment in developing countries: is it TRIMS, TRIPS or Liberalisation?* 6th International Conference on Interdisciplinary Social Sciences. 11-13 July, 2011. University of New Orleans, 2045 Lakeshore Drive, CERM 245, New Orleans, LA 70122, USA.
- Shah, M.H. (2011f). *The significance of infrastructure for inward FDI in developing countries*. International Conference on Applied Business & Economics, ICABE, 2011. 29th September to 1st October, 2011. University of Applied Sciences, Metropolitan Hotel, 385 Syngrou Ave, 17564, Athens, Greece.
- Shah, M.H. (2012a). *The importance of adherence to Intellectual Property Rights (IPRs) treaties / conventions for FDI inflows in emerging economies: evidence from OECD outward FDI*. International Network for Economic Research, 14th INFER Annual Conference. 10-13 May, 2012. Faculty of Economics, University of Coimbra, Portugal.
- Shah, M.H. (2012b). *The significance of infrastructure for FDI inflow in developing countries*. International Network for Economic Research, 14th INFER Annual Conference. 10-13 May, 2012. Faculty of Economics, University of Coimbra, Portugal.
- Shah, M.H. (2012c). *The effect of macroeconomic stability on inward FDI in developing countries*. 7th International Conference on Interdisciplinary Social Sciences. 25-28 June, 2012. Universidad Abat Oliba CEU, Bellesguard 30-08022, Barcelona, Spain.
- Shah, M.H. (2012d). *The significance of infrastructure for FDI inflow in developing countries*. Challenges for Analysis of the Business and the Economy-Scientific Conference. 13-16 September, 2012. University of Applied Sciences, Bahnhofstrasse, 15745 Wildau, Berlin, Germany.
- Shah, M.H. (2013a). *The importance of adherence to Intellectual Property Rights (IPRs) treaties/ conventions for FDI inflows in emerging economies: evidence from OECD outward FDI*. European Economics and Finance Society, EEFS2013, The Twelfth Annual EEFS Conference. 20-23 June, 2013. Westin Grand, Berlin, Germany.

- Shah, M.H. (2013b). *The effect of macroeconomic stability on inward FDI in developing countries*. European Economics and Finance Society, EEFS2013, The Twelfth Annual EEFS Conference. 20-23 June, 2013. Westin Grand, Berlin, Germany.
- Shah, M.H. (2014a). *The role of human capital in the host economy on inward FDI in developing countries*. West East Institute, European Academic Conference Budapest, WEI 2014, 22-25 June, 2014. Mercure Budapest Korona, Hungary. Organized by West East Institute, 19382 West Chester, PA, USA.
- Shah, M.H. (2014b). The significance of infrastructure for FDI inflow in developing countries. *Journal of Life Economics*, 2, 1-16.
- Shah, M.H. & Qayyum, S. (2015). Impact of Double Taxation Treaties on Inward FDI in Latin American and Caribbean Developing Countries. *Business & Economic Review*. 7(1), 1-18.
- Shah, M.H. (2015). *Impact of trade liberalization on FDI inflows in emerging countries*. International Social Sciences and Education Research Conference ICBTS2015, 9-13 June, 2015 at Harvard University, Boston, Massachusetts, USA.
- Shah, M.H. & Faiz, M. (2015). Terrorism and foreign direct investment: An empirical analysis of SAARC countries. *City University Research Journal*. 5(2), 219-233.
- Shah, M.H. & Samdani, S. (2015). Impact of trade liberalization on FDI inflows to D-8 countries. *Global Management Journal for Academic & Corporate Studies (GMJACS)*, 5(1), 30-37.
- Shah, M.H. & Afridi, A.G. (2015). Significance of Good Governance for FDI Inflows in SAARC Countries. *Business & Economic Review*. 7(2), 31-52.
- Shah, M.H. & Khan, Y. (2016). Trade Liberalization and FDI Inflows in Emerging Economies. *Business & Economic Review*. 8(1), 35-52.
- Shrestha, H. (2003). Determinants of Foreign Direct Investment in Africa, *Journal of Developing Societies*, Vol.20 (1), pp.89-106.
- Ting, Y. & Cheong, T. (2009). The Determinants of Inward Foreign Direct Investments: The Case of Malaysia. *Journal of Economic and Business Review*. 28(4), 131-137.
- Ullah, S, Haider S.Z., & Azim. P. (2002). Impact of Exchange Rate Volatility on Foreign Direct Investments: A Case Study of Pakistan. *Journal of Pakistan Economic Review*. 50(2), 121-138.
- UNCTAD. (2003). World Investment Report 2003. *FDI Policies for Development: National and International Perspectives*. Geneva and New York: United Nations
- UNCTAD. (2006). *FDI from Developing and Transition Economies: Implications for Development*, World Investment Report 2006, Geneva: United Nations.
- UNCTAD, (2011). World Investment Report 2011: *Non-equity Modes of International Production and Development*, Geneva: United Nations
- Vijayakumar, N., Sridharan, P, Rao, K & Chandra, S. (2010). Determinants of Foreign Direct Investments in the BRICS Countries, *International. Journal of Business Science and Applied Management*. 5(3), 2010
- Zafar, M. (2013). Determinants of inward FDI in SAARC Countries: Evidence from a time series data analysis. *Journal of Economics and Sustainable Development*, 4(5), 1050-1055.