DETERMINANTS OF FOREIGN DIRECT INVESTMENT (FDI) IN BRICS COUNTRIES

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Abstract
Foreign Direct Investment has become one of the most important economic flows in the global market. The role played by FDI in Economic growth of an economy and living experience of BRICS economies drew the attention of researchers and policy makers to explore the FDI lead growth linkage and identify the push and pull factors of FDI destinations. In this study, an assessment is made to identify these issues with the assist of statistical tools to find determining factors of FDI flows among BRICS countries. Factor analysis and Correlation are used to measure the variables which are inducing to attract FDI and the linear relationship between variables. these countries face various challenges in order to maintain their determining factors in FDI inflows they should optimize their economic condition as well as their policy implications to attract more FDIs openings and these countries may play a major role in global trade in future.

Key words: Foreign Direct Investment, BRICS, Correlation and Factor analysis.

Introduction

Foreign Direct Investment has become one of the most important economic flows in the global market. The role played by FDI in Economic growth of an economy and living experience of BRICS economies drew the attention of researchers and policy makers to explore the FDI led growth linkage and recognize the push and pull factors of FDI destinations. Investment into India could mostly follow the automatic route with no licenses or authorizations required. Investment in sectors that have restrictions such as single brand retail, private banking, insurance, stock trade needs to be approved by Foreign Investment Promotion Board (FIPB). This study deals with determinants of Foreign Direct Investment with the help of a statistical tool namely, Factor analysis and Correlation. The factor analysis is a multivariate technique also known as data reduction. It can be used in situations where studying large number of variables affecting a particular situation.

Reviews from Earlier Studies

Yunyun Duan (2010)[1] "*Foreign Direct Investment in BRICS: A Sector Level Analysis* compared the overall trends and industrial patterns of inward Foreign Direct Investment in the BRICS and explaining their determinants. The overall trends of the inward Foreign Direct Investment in the BRICS are increasing. Nevertheless, the industrial pattern of inward FDI are different from each other. The study found that in Brazil, Russia and India the territory sector receives the most inward FDI on average over the least and secondary sectors in the middle but China has a special industrial pattern of inward FDI, that is the secondary dominant the majority of the inward FDI and the primary territory sector receives only a bit.

Narayana moorthy, Vijaya kumar and et., al., (2010)[2] in their research paper, "*Determinants of BRICS Countries-A Panel analysis*", examined the factors determining FDI inflows of BRICS countries using annual dataset from the period 1975 to 2007. The study employed panel data analysis and found that the selected variables market size, labor cost, infrastructure, currency value and cross capital formation as the potential determinants of FDI inflows of BRICS countries this would contribute to a greater understanding of the FDI determinants in the emerging markets as well as the findings of this study would also lay emphasis on the importance of liberalization and economic policy reforms.

Vinit Ranjan and Gaurav Agarwal (2011)[3] in their paper "*FDI Inflows Determinants in BRIC Countries: A Panel Data Analysis*", explored Foreign Direct Investment inflow determinants in BRIC countries. A random

effect model is employed on the panel data set consisting of annual frequency data of 35 years ranging from 1975-2009, to identify the FDI inflow determinants. The empirical results showed that market size, trade openness, labour cost, infrastructure facilities and macroeconomic stability and growth prospects are potential determinants of FDI inflow in BRIC where as gross capital formation and labour force are insignificant, although Macroeconomic stability and growth prospects had little impact.

Bruce Blonigen A and Jeremy Piger (2011)[4] in their research paper, "*Determinants of Foreign Direct Investment*", made empirical analysis of the factors determining Foreign Direct Investment (FDI) across countries has employed a variety of econometric specifications. The study used Bayesian statistical techniques that allow one to select from a large set of candidates those variables most likely to be determinants of FDI activity. The variables with consistently high inclusion probabilities are traditional gravity variables, cultural distance factors, parent-country per capita GDP, relative labor endowments, and regional trade agreements. The results showed little support for government policies to encourage FDI, as there is no robust evidence in our analysis that policy variables controlled by the host country (such as multilateral trade costs, business costs, infrastructure, or political institutions) have an effect of FDI.

Statement of the Problem
Foreign Direct Investment is an important instrument for the development of the economies and it would be recognized by a country at the time when it is opened up for others for their investment, business, and trade. Past decades, the development in market size, Gross Domestic Product value, employment opportunities, as well as more forceful struggle for FDI have directed to reduce restriction on foreign investment and disbursed scope for FDI flows between the BRICS nations. The better market prospective and financial growth of FDI flows to India from various countries and FDI flows from host countries have increased. India possesses abundance of natural resources and industry resources for easier and more rapidly growth. However, the relationships among the factors of FDI flows towards BRICS countries are relatively less researched and also prove whether precise factors have any impact on FDI flows among these five countries. In this study, an assessment is made to identify these issues with the assist of statistical tools to find determining factors of FDI flows among BRICS countries. The research on FDI is one of the most precise areas of International business in the last decade. Although there are a number of researches on determinants of Foreign Direct Investment, the empirical studies of this nature is insufficient. The present study includes an investigation at global level BRICS countries. By way of this background the contemporary research work desires to find resolution for the following research queries:

➢ Is there any relationship between FDI inflows in BRICS countries?
➢ What are all the factors determining FDI in BRICS countries?

Objectives of the Study
The objectives of the study are:
1. To analyze the relationship among select variables of Foreign Direct Investment (FDI) in BRICS countries.
2. To analyze the Determinants and relationship of Foreign Direct Investment (FDI) in BRICS countries.

Research Design
Sources of Data
The present study is based on secondary data and the data used for the analysis have been collected from World Bank data, RBI bulletins, reports, and journals. The study covers fiscal years from 2008-2009 to 2012-2013. The statistical tools used in this study are: Correlation analysis and Factor analysis. The Correlation analysis is used for the study to measure the relationship between the selected variables. The purpose of factor analysis used in this study can identify out of nine variables which variables are inducing to attract Foreign Direct Investment among the BRICS countries to develop economic stability.

The select variables are consider for the study namely, Imports(IMP), Exports(EXP),Market Size(MKTSZ), Economic Stability(ECOST), Industrial Production Index(IPI), Interest Rates(IR), Inflation Rates(IRS), Currency Value (CURV) and Gross Capital Formation(GCF). To decide the number of factors the criteria used in that, the Eigen value should be more than one. To find out the variables which are similar and form a factor, a component loading of 0.7 and above is considered to be significant and measured with star mark(*).

Hypotheses of the Study
H_{01}**:** There is no relationship between the select variables of FDI in BRICS countries**.**
H_{02}**:** The selected variable does not influence the FDI in BRICS countries.

Table-1: Summary of Correlation Analysis of Select Variables in BRICS Countries from the period of 2008-2009 to 2012-2013

COUNTRIES	Variables	INF	OUTF	IMP	EXP	MKTSZ	ECOST	IPI	IR	IRS	CURV	GCF
BRAZIL	INF	1										
	OUTF	-.050	1									
	IMP	.976**	-.218	1								
	EXP	.989**	-.187	.985**	1							
	MKTSZ	.854	-.308	.928*	.882*	1						
	ECOST	.205	.880*	.059	.096	.066	1					
	IPI	.616	-.010	.661	.621	.854	.431	1				
	IR	.548	-.121	.453	.594	.323	.131	.238	1			
	IRS	-.398	.767	-.528	-.470	-.441	.786	056	-.014	1		
	CURV	-.581	-.288	-.512	-.565	-.598	-.699	-.832	-.591	-.399	1	
	GCF	.863	-.176	912*	.877	.987**	.219	908*	364	-.298	-.710	1
RUSSIA	INF	1										
	OUTF	.621	1									
	IMP	.642	.701	1								
	EXP	.705	.757	.994**	1							
	MKTSZ	.598	.704	.998**	.989**	1						
	ECOST	.749	.762	.734	.784	.716	1					
	IPI	.809	.733	.970**	.985**	.955*	.790	1				
	IR	-.060	.509	.676	.635	.716	.452	.494	1			
	IRS	.752	.819	.698	.758	.681	.992**	.764	.425	1		
	CURV	-.910*	-.426	-.278	-.363	-.224	-.608	-.499	.397	-.630	1	
	GCF	.633	.683	.999**	.991**	.998**	.713	.967**	.672	.675	-.264	1
INDIA	INF	1										
	OUTF	.187	1									
	IMP	-.483	.558	1								
	EXP	-.518	.596	.993**	1							
	MKTSZ	-.664	.418	.955*	.954*	1						
	ECOST	-.565	-.259	-.032	-.012	.260	1					
	IPI	-.632	.479	.939*	.942*	.993**	.311	1				
	IR	.098	.300	.558	.521	.317	-.807	.242	1			
	IRS	-.072	.763	.248	.346	.181	-.105	.235	.011	1		
	CURV	-.461	-.338	.542	.470	.551	-.041	.462	.532	-.605	1	
	GCF	-.603	.488	.958*	.956*	.995**	.254	.998**	.302	.216	.495	1

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		INF	OUTF	IMP	EXP	MKTSZ	ECOST	IPI	IR	IRS	CURV	GCF
CHINA	**INF**	1										
	OUTF	.840	1									
	IMP	.654	.208	1								
	EXP	.762	.358	.977**	1							
	MKTSZ	.788	.983**	.100	.237	1						
	ECOST	-.247	-.568	.527	.348	-.616	1					
	IPI	.515	.850	-.094	.087	.801	-.661	1				
	IR	-.617	-.774	-.323	-.357	-.762	.031	-.616	1			
	IRS	.553	.033	.963**	.915*	-.053	.560	-.315	-.105	1		
	CURV	-.725	-.945*	.033	-.114	-.981**	.739	-.774	.635	.154	1	
	GCF	.714	.965**	.024	.151	.991**	-.600	.814	-.802	-.144	-.968**	1
SOUTH AFRICA	**INF**	1										
	OUTF	.354	1									
	IMP	.986	.506	1								
	EXP	-.981	-.527	.974*	1							
	MKTSZ	.916	-.052	.835	-.821	1						
	ECOST	.002	-.934	-.165	.190	.404	1					
	IPI	-.447	-.995	-.590	.610	-.049	.894	1				
	IR	.950	.628	.989	-.992	.745	-.309	-.703	1			
	IRS	-.862	-.780	-.935	.943	-.585	.505	.839	-.977	1		
	CURV	.298	.998*	.453	-.476	-.111	-.954	-.987	.581	-.741	1	
	GCF	.963	.091	.905	-.894	.990	.271	-.190	.832	-.694	.031	1

Sources: Compiled and calculated from the data published in World Bank Data

Testing of Hypothesis

Above table reveals the Correlation analysis of selected variables in BRICS from the period of 2008-2009 to 2012-2013. The positive Correlation was observed in Brazil between imports and inflows (.976), exports correlated with inflows and imports (.989 and .985), gross capital formation and market size (.987) which are significant at 1 percent level. Market size correlated with imports and exports (.928 and .882), economic stability and outflows (.880) and gross capital formation with imports and industrial production index (.912 and .908) which are significant at 5 percent level. In Russia, the positive Correlation was observed between exports and imports (.994), market size correlated with imports and exports (.998and .989), industrial production index correlated with imports and exports (.970 and .985), inflation rates and economic stability (.992) and gross capital formation correlated with imports, exports, market size and industrial production index (.999, .991, .998 and .967) which are significant at 1percent level. Industrial production index and market size (.955), currency value and inflows are correlated with negative value (-.910) which are significant at 5 percent level.

In India, the positive Correlation was observed between exports and imports (.993), industrial production index and market size (.993), gross capital formation correlated with industrial production index and market size (.995 and .998) which are significant at 1 percent level. Market size correlated with imports and exports (.955 and .954), industrial production index correlated with imports and exports (.939 and .942), gross capital formation correlated with imports and exports (.958 and .956) which are significant at 5 percent level. The positive Correlation was observed between exports and imports (.977), market size and outflows (.983), inflation and inflows (.963), market size and currency value correlated negatively (-.981), gross capital formation correlated with outflows and market size (.965 and .991) and negatively correlated with currency (-.968) which are significant at 1 percent level. Inflation and exports (.915) and currency value correlated with outflows negatively (-.945) which are significant at 5 percent level. The positive Correlation was observed between exports and imports (.974) and currency value and outflows (.998) which are significant at 1 percent level.

Table-2: Summary of Factor analysis of FDI in BRICS countries from the period of 2008-2009 to 2012-13

countries Variables	BRAZIL				RUSSIA				INDIA					CHINA				SOUTH AFRICA			
	Component loadings		Communalities	Ranks	Component loadings		Communalities	Ranks	Component loadings			Communalities	Ranks	Component loadings		Communalities	Ranks	Component loadings		Communalities	Ranks
	Factor 1	Factor 2			Factor 1	Factor 2			Factor 1	Factor 2	Factor 3			Factor 1	Factor 2			Factor 1	Factor 2		
Imports	0.950*	-0.219	**0.951**	3	0.930*	0.311	**0.961**	3	0.110	0.962*	0.246	**0.987**	2.5	0.048	0.997*	**0.996**	1	0.947*	-0.321	**0.951**	3
Exports	0.952*	-0.168	**0.934**	6	0.398	0.906*	**0.978**	-	0.960*	0.189	0.203	**0.995**	1	0.202	0.957*	**0.957**	5	-0.939	0.345	0.304	1
Market Size	0.951*	-0.177	**0.936**	5	0.950*	0.259	**0.969**	4	0.997*	0.029	-0.041	**0.987**	2.5	0.991*	0.060	**0.985**	2	0.968*	0.253	**0.942**	2
Economic Stability	0.245	0.955*	**0.973**	1	0.638	0.651	0.831	1	0.215	-0.106	-0.957	0.974	4	-0.663	0.574	0.770	-	0.160	0.987*	**0.983**	-
Industrial Production Index	0.830*	0.269	**0.761**	7	0.820*	0.527	**0.951**	6	0.982*	0.113	-0.097	**0.976**	-	0.874*	-0.163	**0.791**	6	-0.300	0.954*	**0.861**	4
Interest Rates	0.547	0.075	0.304	2	0.897*	-0.346	**0.925**	-	0.367	-0.105	0.911*	**0.966**	5	-0.742	-0.304	0.643	-	0.889*	-0.458	**0.934**	6
Inflation Rates	-0.293	0.934*	**0.958**	-	0.607	0.676	0.824	5	0.175	0.918*	-0.012	**0.874**	7	-0.123	0.973*	**0.963**	4	-0.771	0.637	0.951	-
Currency Valuation	-0.744	-0.594	0.906	-	0.045	-0.998	0.998	-	0.586	-0.768	0.258	0.976	-	-0.974	0.072	0.953	-	0.143	-0.990	0.964	-
Gross Capital Formation	0.971*	-0.020	**0.944**	4	0.928*	0.296	**0.949**	2	0.986*	0.097	-0.033	**0.924**	6	0.985*	-.013	**0.971**	3	0.994*	0.113	**0.978**	5

Eigen Value 6.246	3.099		8.012	2.027		6.016	2.436	2.057		6.32	3.654		7.439	3.561	
Variance Explained 6.245	3.101		6.281	3.757		5.953	2.294	2.261		6.251	3.723		6.239	4.761	
Percentage of Variance Explained 56.784	28.176	84.961	72.834	18.428	91.262	54.688	22.146	18.699	95.533	57.456	33.219	90.675	57.351	25.171	82.52

Sources: Compiled and calculated from the data published in World Bank Data.
**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Testing of Hypothesis
Above table shows the factor analysis of foreign direct investment in BRICS from the period of 2008-2009 to 2012-2013. In Brazil, factor 1 the variables imports had a loading of 0.95, followed by exports (0.95), and market size (0.95), industrial production index (0.83), and gross capital formation had a loading of 0.97. Rest of the variables had a loading of less than 0.7. Hence, the variables which are more than 0.7 form one factor. In factor 2 the variables economic stability (0.95) and inflation rates (0.93) are had a loading of greater than 0.7. These three factors form the second factor. The other variables in factor 2 had a loading of less than 0.7. These are all the variables which are highly influencing the FDI in Brazil. The high variation explained factor 1 is 56.78 percent when compared to factor 2 is 28.17 percent low. The total variance explained from factor1 and factors 2 are explained to be at 84.96 Percent. Out of the nine variables only seven had a loading of 0.7 and above. The ranks can be assigned for these nine variables based on the component loadings.

In Russia, factor 1 the variables like imports had a loading of 0.93 followed market size (0.95), industrial production index (0.82), interest rates (0.89), and gross capital formation had a loading of 0.92.Rest of the variables had a loading of less than 0.7. Hence, the variables which are more than 0.7 form one factor. In factor 2 the variable exports only had a loading of 0.92 is greater than 0.7. This factor forms the second factor. The other variables in the factor 2 had a loading of less than 0.7. These are all the variables which are highly influencing the FDI in Russia. The high variation explained in factor 1 is 72.83 percent of when compared to factor 2 is 18.42 percent low. The total variance explained from factor1 and factors 2 are explained is to be at 91.26 per cent. Out of the nine variables only six had a loading of 0.7 and above. The ranks can be assigned for these seven variables based on the component loadings.

In India, factor 1 the variables like exports 0.99, followed by market size (0.98), industrial production index (0.97) and gross capital formation had a loading of 0.92.Rest of the variables had a loading of less than 0.7. Hence, the variables which are more than 0.7 form one factor. In factor 2 the variables imports had a loading of 0.98 and inflation rates had a loading of 0.87 is greater than 0.7. This factor forms the second factor. The other variables in the factor 2 had a loading of less than 0.7.In factor 3 the variable interest rates only had a loading of 0.96 is greater than 0.7. This factor forms the third factor. The other variables in the factor 3 had a loading of less than 0.7 are insignificant factors. These are all the variables which are highly influencing the FDI in India. The high variation explained factor 1 is 54.68 percent when compared to factor 2 is 22.14 percent and factor 3 is 18.69 percent low. The total variance explained from factor1, factor 2 and factor 3 are explained to be at 95.53 per cent. Out of the

nine variables only seven had a loading of 0.7 and above. The ranks can be assigned for these eight variables based on the component loadings.

In China, factor 1 the variables like market size had a loading of 0.99, followed by industrial production index (0.87) and gross capital formation had a loading of 0.98.Rest of the variables had a loading of less than 0.7. Hence, the variables which are more than 0.7 form one factor. In factor 2 the variables imports (0.99), exports (0.95), and inflation rates (0.97) are had a loading of greater than 0.7. These three variables form the second factor. The other variables in factor 2 had a loading of less than 0.7. These are all the variables which are highly influencing the FDI in China. The high variation explained factor 1 is 57.45 percent when compared to factor 2 is 33.21 percent low. The total variance explained from factor1 and factors 2 are explained to be at 90.67 per cent. Out of the nine variables only six had a loading of 0.7 and above. The ranks can be assigned for these eight variables based on the component loadings.

In South Africa, factor 1 the variables like market size had a loading of 0.96, followed by imports (0.94), and interest rates (0.88) and gross capital formation had a loading of 0.99.Rest of the variables had a loading of less than 0.7. Hence, the variables which are more than 0.7 form one factor. In factor 2 the variables economic stability (0.98) and industrial production index (0.95) are had a loading of greater than 0.7. These three factors form the second factor. The other variables in factor 2 had a loading of less than 0.7. These are all the variables which are highly influencing the FDI in South Africa. The high variation explained factor 1 is 57.75 percent of when compared to factor 2 is 25.17 percent low. The total variance explained from factor1 and factors 2 are explained to be at 82.52 percent. Out of the nine variables only six had a loading of 0.7 and above. The ranks can be assigned for these seven variables based on the component loadings.

Conclusion
Foreign Direct investment plays an important role in the development of a country not only as a source of capital but also enhancing competitiveness of the domestic economy and employment opportunities.FDI inflows showed an uneven pattern across regions. Improved macro-economic conditions, particularly in the emerging economies, which improved corporate profits attached with better stock market valuations and rising business confidence augured well for global FDI prospects. The BRICS countries are gearing themselves towards preparing for a greater role in the international market. The force is being supported by a number of initiatives in different BRICS countries to increase their global competitiveness, and to facilitate Investment climate. These fast developing economies are having superior marketplace at global level which attracts more FDI inflows. But, these countries face various challenges in order to maintain their determining factors in FDI inflows they should optimize their economic condition as well as their policy implications to attract more FDIs openings and these countries may play a major role in global trade in future.

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