
Foreign Direct Investment, Currency Exchange rates and BRICs countries

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Abstract

BRICs countries stand out the large potential consumer market which attracts large capital due to general characteristics of large-scale population. BRICs countries are listed as emerging countries as a whole these countries do not have an economic union that can stand their trade and integration collectively. The BRIC are both the fastest growing and largest emerging markets economies. They account for almost three billion people, or just under half of the total population of the world. In recent times, the BRIC have also contributed to the majority of world's GDP growth. The objective of research is to find out that does exchange rate and FDI related in BRICs countries? This research work is being designed in such a way that it helps to understand the relationship between foreign exchange rate and FDI in BRICs. It will be a quantitative research based on secondary data. We will use statistical tools for research results. Statistical Tools will be correlation analysis, linear regression analysis and graphical analysis of different variables. This sample consists of data from 1981 to 2014 on yearly bases. Summarizing the results it could be written as a result this paper shows that the FDI increases with increase in exchange rates of currency. Changing exchange rate is one factors to change the FDI in BRICs, there could be research on other factors that has causal relationship with foreign direct investment in BRICs.

Key words: BRICs, FDI, Exchange rate, Import and export.

Introduction

In a broader sense, the direct investment from abroad will include "construction of a new facility to re-invest the profits obtained from overseas operations and intra-company loans, mergers and acquisitions." In the narrow sense, the direct investment from abroad simply refers to the construction of a new facility. It is not possible to easily compare a number of numerical FDI based on a variety of definitions. FDI is defined as operating within the investors of the other economy; in order to obtain a permanent management interest rates (10% or more of voting stock) in the enterprise, net inflows of investment and (inflow minus outflow). As it is shown the balance of payments, FDI capital, other long-term capital, and is the sum of short-term capital. FDI is usually participation in the management involves a joint venture the transfer of technology and know-how. Direct investment excludes investment through purchase of shares. FDI the foreign direct investment (FDI) is an example of international factors of movement to dominate ownership of the country's companies of each entity based in another country.

Brief Objectives of Research

Foreign direct investment can provide a number of advantages like creation of employment, transfer of resources, improvement of financial stability and economic boost. Foreign investors will also be able to receive a share of the benefits. For example, FDI is able to reduce the overall risk of foreign diversification (Economy watch 2010). Also, it is possible to reduce the cost by economies of scale.

However, foreign investors, not only such political risk and legal risk but also exposed to reduce many kinds of risk. Among the ongoing risk they face, a risk is the risk of exchange rate. Certainly, foreign investors will think over before a strategic move, but it is one of the most important things. The purpose of this report on Brazil, Russia, India and China (BRIC) is to be specific, when emerging market you choose to explore the impact of volatility in exchange rates.

They dissociate the effect of uncertainty of exchange rate on imports to exporters. Risk (I.e. for importers and exporters) has impact in accordance with the people who are having the impact on the price of tradable goods like positive (exporters) or negative (importer).

There were estimated indicators of economic growth of trading partners, those are the relative to export price of a measure of trading partners, the actual export earnings of fluctuations in oil exporter and exchange rate (in the volume) by the linear regression had been observed. Two measures of variation were used in both nominal and real exchange rate. The first was the logarithm of the moving standard deviation. Second is corresponding distribution lag of absolute percentage change in polynomial.

The changes that contained the real exchange rate volatility of real exports and nominal exchange rate have positive relationship (Bailey et al., 1987).

Such co-integration and error-correction model with the development of new theory and methodology of time series econometrics, such as, economists and volatility of the exchange rate exports have begun looking at the long-term relationship. Aizenman (1992) has adopted a co integration test and error correction model.

They are investigating the impact of real exchange rate volatility on export flows of thirteen developing countries. There were both short-term and long-term negative insignificant relationship had been found (Arize et al., 2000).

Literature Review

Other authors (for example, Krone and Lastrapes, 1990) investigate the relationship between volatility and trade exchange rate using GARCH model that time (high or low volatility of exchange rate interest cluster in the period in order to change the conditional volatility.

Koray and Lastrapes (1989) discovered a significant effect although small volatility exchange rate on trade, this effect was observed to vary from country to country. Koray and Lastrapes (1989) study the relationship between volatility and US imports of the real exchange rate using a VAR model that contains the macro variables and found a very weak effect.

Yamakawa et al. (2009) emphasized the diversity of methodologies and case studies in order to the flow of trade of a complete literature review on the impact of exchange rate volatility.

On the other hand, in the bread of studies that has examined the effect of the source and the host country factors, including the exchange and foreign direct investment in China from 1984-1996 showed negative relationship.

Hsing (2004) showed a positive relationship between the exchange rate and FDI upon the research from eighteen major source countries to the inflow of direct investment in China during 1989-2006. In fact, in order to obtain inexpensive labor costs, studies have showed most multinational companies from Hong Kong and Taiwan.

Nevertheless, Zietz and Pemberton (1990) showed the mixed empirical evidence for the eight manufacturing industry in fifteen countries. The result was a somewhat sensitive to the inclusion of the country, using panel data analysis they found negative effect on FDI and exchange rate.

Research Methodology

Research Design

This research work is being designed in such a way that it helps to understand the relationship between foreign exchange rate and FDI in BRICs. It will be a quantitative research based on secondary data. We will use statistical tools for research results. Statistical Tools will be correlation analysis, linear regression analysis and graphical analysis of different variables. The study area of this research work is whole BRICs,

Sample of Research

Sohrabian and Oskooee (2000) used effective exchange rate for the period 1973-1988 and also used yearly data on FDI. The sample of the research will consist of FDI and exchange rates of USD (United States Dollar) compare to BRL (Brazilian real), RUB (Russian ruble), INR (Indian rupee) and CNY (Chinese yuan). Data will be taken for last 34 years to study the relationship between FDI and exchange rates. The exchange rate data will be taken by last 34 years of US dollars, compare to Brazilian real, Russian ruble, Indian rupee, and Chinese yuan with comparatively to the currencies of BRICs countries. This research includes four independent variables currencies and one dependent variable. The independent variable currencies are US dollar comparative to Local Currencies of BRICs and dependent variable is FDI. This sample consists of data from 1981 to 2014 on yearly bases as Hsing (2004); Zietz and Pemberton (1990) determined the macroeconomic variables and developed the model with yearly data. Soenen and Hanniger (1988) used for the period of 1980-1986 yearly data on effective exchange rates and FDI. This

study adopted the methods of these writers.

Research tools

Statistical Tools used, are correlation analysis and linear regression analysis. Different methods were taken up to the mind; there were lot of assumptions regarding different techniques. The study area of this research work is whole BRICs. It is contended by Scown (1990) and Sifunjo (2011); Hsiao methods (1979) and the SMAR or subset model auto regression method of Kunst and Marin (1989) because the causality test are sensitive to lag selection, For the period of 1980-1986, yearly data on effective exchange rates and FDI were examined by Soenen and Hanniger (1988), and they also used regression model to analyze the problem. Solnik (1987); Yang, Huang, and Granger in (1998) and Tabak (2006) used correlation analysis to find out the results upon the relationship of exchange rates and FDI in different countries. Yau and Nieh (2008) were found best to apply on analysis process as he used regression and correlation analysis to find out the answers of research questions and objectives. Arzu (2008) discussed the relationship of exchange rates and FDI in BRICs; he analyzed the yearly data from 1997 to 2007. Simple graphical techniques have been applied to make the results more clear. Changes in all variables have analyzed with linear graphs, these graphs clear showed the upward or downward movement of the exchanges rates of different currencies.

Explanation of variable

Simply two types of variables have been used, one variable is dependent and one is independent but there variables need to test in different three equations for BRICs countries. Dependent variable is FDI in all these three countries and exchange rate is independent variable as change in exchange rate will measure to change FDI.

To explore the knowledge to find out the impact of exchange rate on the FDI is the basic purpose of this study. From the year 1981 to 2014 a purely secondary source of data has been used as the exchange rates within USD and FDI in BRICs countries.

Data Analysis

Interpreting the regression

Two basic types of regressions are used as multiple regression analysis and linear regression analysis. Linear regression uses the X as independent variable and Y as dependent variable. In other words X variable used to predict the outcome of Y variable but multiple regression use two or more than two independent variables to predict the outcome of dependent variable. The general form of linear regression is given below for each three countries.

Linear Regression: $Y = a + bX + u$

Multiple Regression: $Y = a + b_1X_1 + b_2X_2 + b_3X_3 + \dots + b_tX_t + u$

Where:

Y= the variable that we are trying to predict (Foreign Direct Investment)

X= the variable that we are using to predict Y (X is exchange rate)

a= the intercept

b= the slope

u= the regression residual.

In multiple regressions, by separating the subscripted number the separated variables are differentiated.

Regression analysis like to take a group of random variables thought to be predicting Y, on the other hand tries to find out the mathematical relationship between these variables. The relationship is typically shows in straight line also known as regression line the best describe the all individual data points. Regression is often used to determine how many specific factors such as the price of a commodity, interest rates, particular industries or sectors influence the price movement of an asset.

Correlation analysis results for Brazil

Analyzing the correlation results, it seem that there is positive correlation among all the variables, There is positive correlation among the variable, but the results shows a moderate positive correlation, depending upon this resultant figure of 0.59 between FDI and exchange rates. Analyzing this value we can say that there is positive relationship but not to the extent of strong positive. Depending on this value one can conclude that there is any relationship. As a result we can say that increase in exchange rate can increases the FDI in moderate way but we cannot say that the increase in exchange rate would decrease the FDI.

	<i>Exchange Rate</i>	<i>Foreign Direct Investment</i>
Exchange Rate	1	
Foreign Direct Investment	0.596286995	1

Correlation analysis results for Russia

Analyzing the correlation results, it seem that there is positive correlation among all the variables, There is positive correlation among the variable, but the results shows a moderate positive correlation, depending upon this resultant figure of 0.64 between FDI and exchange rates. Analyzing this value we can say that there is positive relationship but not to the extent of strong positive. Depending on this value one can conclude that there is any relationship. As a result we can say that increase in exchange rate can increases the FDI in moderate way but we cannot say that the increase in exchange rate would decrease the FDI.

	<i>Exchange Rate</i>	<i>Foreign Direct Investment</i>
Exchange Rate	1	
Foreign Direct Investment	0.645027089	1

Correlation analysis results for India

Analyzing the correlation results, it seem that there is positive correlation among all the variables, There is positive correlation among the variable, but the results shows a strong positive correlation, depending upon this resultant figure of 0.66 between FDI and exchange rates. Analyzing this value we can say that there is positive relationship but not to the extent of high positive. Depending on this value one can conclude that there is any relationship. As a result we can say that increase in exchange rate can increases the FDI in moderate way but we cannot say that the increase in exchange rate would decrease the FDI.

	<i>Exchange Rate</i>	<i>Foreign Investment</i>	<i>Direct</i>
Exchange Rate	1		
Foreign Investment	0.660586409	1	
Direct			

Correlation analysis results for China

Analyzing the correlation results, it seem that there is positive correlation among all the variables, There is positive correlation among the variable, but the results shows a weak positive correlation, depending upon this resultant figure of 0.31 between FDI and exchange rates. Analyzing this value we can say that there is positive relationship but not to the extent of moderate positive. Depending on this value one can conclude that there is any relationship. As a result we can say that increase in exchange rate can slightly increases the FDI but we cannot say that the increase in exchange rate would decrease the FDI.

	<i>Exchange Rate</i>	<i>Foreign Investment</i>	<i>Direct</i>
Exchange Rate	1		
Foreign Investment	0.319608071	1	
Direct			

Regression analysis for Brazil

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.596286995
R Square	0.355558181
Adjusted R Square	0.335419374
Standard Error	21769588291
Observations	34

<i>ANOVA</i>					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	8.36715E+21	8.36715E+21	17.655375	0.000198003
Residual	32	1.51653E+22	4.73915E+20		
Total	33	2.35324E+22			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>
Intercept	4939991012	5581611480	0.885047451	0.3827333	-6429379522
Exchange Rate	14801236398	3522569135	4.201829923	0.000198	7625997872

Multiple R: It tells the percentage of the response variable variation that is explained by a linear model. Here 59% shows model fit to your data. For example, 0% indicates that the model explains none of the variability & 100% indicates that the model explains all the variability of the response data around its mean.

R square: This is r^2 , the Coefficient of Determination. It tells you how many points fall on the regression line. As here 35% means that 35% of the variation of y-values (Foreign direct investment of Brazil) around the mean is explained by the x-values (Exchange rates in Brazil). In other words, 35% of the values fit the model.

Adjusted R square: The adjusted R-squared adjust for the number of terms in a model. You'll want to use this instead of R square if you have more than one x variable.

Standard Error of the regression: An estimate of the standard deviation of the error μ . This is not the same as the standard error in descriptive statistics! The standard error of the regression is the precision that the regression coefficient is measured; if the coefficient is large compared to the standard error, then the coefficient is probably different from 0.

P value explains the validity of model applied. If the P value is more than 5%, it means that regression model is not fit to the data and this rejects the null hypothesis and accepts the alternative hypothesis. But here P value of intercept is approximately 38% that mean model is rejected. Regression results of least square model are rejected due to P value near to 38% of intercept. Explanation of the data is perfect analyzing the F significance value approximately to zero tells that the results are not by chance, in other words there is zero probability of 'by chance' results. Results shows that there is weak relationship between variable

Regression analysis for Russia

SUMMARY OUTPUT

<i>Regression Statistics</i>					
Multiple R	0.645027089				
R Square	0.416059946				
Adjusted R Square	0.397811819				
Standard Error	17688400404				
Observations	34				

<i>ANOVA</i>					
	<i>Df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	7.1337E+21	7.134E+21	22.80014559	3.81799E-05
Residual	32	1.00121E+22	3.129E+20		
Total	33	1.71458E+22			

	<i>Standard</i>				
	<i>Coefficients</i>	<i>Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>
Intercept	87758692.96	4363787586	0.0201107	0.984079964	-8800985745
Exchange Rate	1011970088	211933136.5	4.7749498	3.81799E-05	580276415.3

Multiple R: It tells the percentage of the response variable variation that is explained by a linear model. Here 64% shows model fit to your data. For example, 0% indicates that the model explains none of the variability & 100% indicates that the model explains all the variability of the response data around its mean.

R square: This is r^2 , the Coefficient of Determination. It tells you how many points fall on the regression line. As here 41% means that 41% of the variation of y-values (Foreign direct investment of Russia) around the mean is explained by the x-values (Exchange rates in Russia). In other words, 41% of the values fit the model.

Adjusted R square: The adjusted R-squared adjust for the number of terms in a model. You'll want to use this instead of R square if you have more than one x variable.

Standard Error of the regression: An estimate of the standard deviation of the error μ . This is not the same as the standard error in descriptive statistics! The standard error of the regression is the precision that the regression coefficient is measured; if the coefficient is large compared to the standard error, then the coefficient is probably different from 0.

P value explains the validity of model applied. If the P value is more than 5%, it means that regression model is not fit to the data and this accepts the null hypothesis and rejects the alternative hypothesis. But here P value is of intercept is 0.98. Regression results of least square model are acceptable due to P value near to zero of intercept. Explanation of the data is perfect analyzing the F significance value approximately to zero tells that the results are not by chance, in other words there is zero probability of 'by chance' results. Results shows that there is weak relationship between variable

Regression analysis for India

SUMMARY OUTPUT

<i>Regression Statistics</i>					
Multiple R		0.660586409			
R Square		0.436374404			
Adjusted R Square		0.418761104			
Standard Error		10235346545			
Observations		34			

ANOVA					
	<i>Df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	2.59552E+21	2.5955E+21	24.7752781	2.12158E-05
Residual	32	3.35239E+21	1.0476E+20		
Total	33	5.94791E+21			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>
Intercept	-9297987889	4160516192	-2.2348159	0.03253812	-17772682046
Exchange Rate	556008898.9	111704964.1	4.97747708	2.1216E-05	328473333

Multiple R: Multiple R: It tells the percentage of the response variable variation that is explained

by a linear model. Here 64% shows model fit to your data. For example, 0% indicates that the model explains none of the variability & 100% indicates that the model explains all the variability of the response data around its mean.

R square: This is r^2 , the Coefficient of Determination. It tells you how many points fall on the regression line. As here 43% means that 43% of the variation of y-values (Foreign direct investment of India) around the mean is explained by the x-values (Exchange rates in India). In other words, 43% of the values fit the model.

Adjusted R square: The adjusted R-squared adjust for the number of terms in a model. You'll want to use this instead of R square if you have more than one x variable.

Standard Error of the regression: An estimate of the standard deviation of the error μ . This is not the same as the standard error in descriptive statistics! The standard error of the regression is the precision that the regression coefficient is measured; if the coefficient is large compared to the standard error, then the coefficient is probably different from 0.

P value explains the validity of model applied. If the P value is more than 5%, it means that regression model is not fit to the data and this accepts the null hypothesis and rejects the alternative hypothesis. But here P value of intercept is approximately zero that mean model is acceptable. Regression results of least square model are acceptable due to P value near to zero of intercept. Explanation of the data is perfect analyzing the F significance value approximately to zero tells that the results are not by chance, in other words there is zero probability of 'by chance' results. Results show that there is significant relationship between variable.

Regression analysis for China

SUMMARY OUTPUT

<i>Regression Statistics</i>					
Multiple R	0.319608071				
R Square	0.102149319				
Adjusted R Square	0.074091486				
Standard Error	90236005791				
Observations	34				

<i>ANOVA</i>					
	<i>Df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	2.96443E+22	2.9644E+22	3.6406702	0.065391067
Residual	32	2.60561E+23	8.1425E+21		
Total	33	2.90205E+23			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>
Intercept	-4630403511	44982031360	-0.102939	0.91865382	-96255803045
Exchange Rate	13179443801	6907269688	1.90805404	0.06539107	-890204137.9

Multiple R: It tells the percentage of the response variable variation that is explained by a linear model. Here 31% shows model fit to your data. For example, 0% indicates that the model

explains none of the variability & 100% indicates that the model explains all the variability of the response data around its mean.

R square: This is r^2 , the Coefficient of Determination. It tells you how many points fall on the regression line. As here 10% means that 10% of the variation of y-values (Foreign direct investment of India) around the mean is explained by the x-values (Exchange rates in India).

Adjusted R square: The adjusted R-squared adjust for the number of terms in a model. You'll want to use this instead of R square if you have more than one x variable.

Standard Error of the regression: An estimate of the standard deviation of the error μ . This is not the same as the standard error in descriptive statistics! The standard error of the regression is the precision that the regression coefficient is measured; if the coefficient is large compared to the standard error, then the coefficient is probably different from 0.

P value explains the validity of model applied. If the P value is more than 5%, it means that regression model is not fit to the data and this rejects the null hypothesis and accepts the alternative hypothesis. But here P value is of intercept is approximately zero that mean model is acceptable. Regression results of least square model are acceptable due to P value near to zero of intercept. Explanation of the data is perfect analyzing the F significance value approximately to zero tells that the results are not by chance, in other words there is zero probability of 'by chance' results. Results show that there is weak relationship between variables.

Testing of Hypothesis

For Brazil

Depending on P value here we accept null hypothesis (there is no positive correlation between FDI and Exchange rate variables) as p value is more than 5%

For Russia

Depending on P value here we accept null hypothesis (there is no positive correlation between FDI and Exchange rate variables) as p value is more than 5%

For India

Depending on P value here we accept alternative hypothesis (there is positive correlation between FDI and Exchange rate variables) as p value is less than 5%

For China

Depending on P value here we accept null hypothesis (there is no positive correlation between FDI and Exchange rate variables) as p value is more than 5%.

Conclusion

Analyzing these casual variables of these four countries (Brazil, Russia, China and India) there is no clash of results by using different methods of analysis. Further, depending on p values of regression analysis, results in correlation analysis and graphical explanation of movement in both variables, there is no clash of interest in results by using the all these three analytical techniques. All these techniques support the results in same way. So results could be explained as, For Brazil, depending on P value, correlation and graphs here we accept null hypothesis as p value is more than 5%, correlation is 0.5962. For Russia: depending on P value, correlation and graphs here we accept alternative hypothesis as p value is more than 5% and correlations is about 0.6450. For India: Depending on P value, correlation and graphs here we accept alternative

hypothesis as p value is less than 5% and correlation is 0.6605. For China: Depending on P value, correlation and graphs here we accept null hypothesis as p value is more than 5% and correlation is 0.3196. Summarizing the results it could be written as a result this paper shows that the FDI increases with increase in exchange rates of currency. Changing exchange rate is one factors to change the FDI in BRICs, there could be research on other factors that has causal relationship with foreign direct investment in BRICs.

Recommendation

- The FDI increases with increase in exchange rates of currency, same on the other hand it is economically bad impression for a country when its exchange rates are not under control and its worst condition for a country when the value of its currency decrease or exchange rates in particularly country increase with the passage of time.
- It is recommended that the exchange must be at stable condition.
- It is also recommended that further research could be conducted on factors that affect the price movements of different currencies in these countries.
- Changing exchange rate is one factors to change the FDI in BRICs, there could be research on other factors that has causal relationship with foreign direct investment in BRICs.
- There should be research on the factors that can decrease the exchange rate within the country.
- Factors that increase the foreign direct investment could be studied in BRICs as there should be more cumulative research on these countries.
- In BRICs countries it would be race wining if these maintain their exchange rates in the country because it would be achievement for stabilized economic conditions.

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