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## Impact of exchange rate on FDI: A comparative study of India and China

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### Abstract

India and China are the emerging economies in the world. These two countries have about 37.5 percent population of the World. This study was conducted to examine the impact of exchange rate on foreign direct investment in India and China. For analyzing impact of exchange rate on FDI the correlation and regression analysis techniques have been used. It observed that the during 1991 to 2014 foreign direct investment in India increased by 458.89 times in absolute terms whereas, the FDI in China increased by 29.43 times in absolute terms during the same period. The exchange rate shows the 2.68 times decrease in value of Indian rupee in terms of US dollar and 1.15 times decrease in Chinas Yuan in term of US dollar during the study period. It is found that there is positive correlation between FDI and exchange rate in India. For China the correlation between FDI and exchange rate is negative. It is observed that one unit increase in exchange rate will raise FDI by 0.605 units in India. In case of China one unit increase in exchange rate will leads to decrease of FDI by 0.2503 units during the study period. The P value 0.0017 indicates that the coefficient of exchange rate variable is highly significant with FDI in case India. The P value 0.238 indicates that the exchange rate variable does not exert significant influence of FDI in case of China.

**Keywords:** Exchange Rate, Foreign Direct Investment, Correlation, Regression

### Introduction

India and China are the emerging economies in the world. China and India, as the two largest developing countries in the world, have been both enjoying fast economic growth since the 1980s. India and China have larger foreign exchange inflows since last five to ten years period. India has become an investment country in the world after adopting new economic policy of 1991. In the context of liberalization there is critical importance of foreign direct investment for India. Though around 70 percent population of India is agro based India has tenth rank in the industrialization in the world. Foreign direct investment is centered in India in the sector of urban development. There is lot of scope to attract foreign direct investment in rural India. Foreign direct investment played an important role in the economic development of India after globalization. Central government of India had announced several numbers of reforms for attracting investors in various sector of India.

The current exchange rate regime in China is mixed i.e. fixed and floating. Yuan was pegged 8.28 Yuan per U.S. dollar during 1994 to 2005 at its fixed regime. China permitted revalue of the Yuan and peg into the basket currencies like dollar, euro, Japanese yen and the Korean won. The Yuan was appreciated 17.5 percent in case of U.S. dollar during July 2005 to February 2010. The many U.S. Policy makers stated that China has more undervalued the Yuan than the pure flexible exchange rate regime valuation.

Foreign direct investment is a major source for the generation of employment and an important driver of economic growth. The government's liberal foreign direct investment policy is playing a proactive role in the promotion of investment. A favorable policy regime helps to increase in foreign direct investment flows into the country. The central government has undertaken several reforms to attract foreign direct investment in the country. Various sectors of economy like construction, civil aviation, plantation, credit information companies trading, broadcasting, private sector banking including, satellite establishment and operation, defense etc. have been liberalized for attracting FDI in India. Foreign direct investment policy permitted 49 percent foreign investment with 26 percent under automatic route while, White label ATM operations and Manufacturing of medical devices have been hundred percent foreign investment under automatic route during 2015-16 in India.

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India and China having about 37.5 percent population of World. So these two countries are huge markets. India and China are playing a massive role in the world economy and has significant impact on world economy. China contributes largest exports and import share in the Indian international trade. China's contribution in is about 19.9 percent in India's total import and it is 3.8 percent in exports. India's share in international trade was only 0.6 percent in 2014. During past few years international trade between India and China has rapidly increased. China is the third largest economy in the world. Indian economy has growing by fast rate. The average exchange rate of Indian rupee was Rs. 65.04 per \$ during 2015-16 as compared to Rs.60.92 per \$ during 2014-15. It was mainly due to stronger growth in the U.S. economy that strengthened dollar against all major currencies and the China's growth and currency development attract the global investors. It should be noted that the Indian rupee has performed better than EMDEs currencies except China Yuan during 2015-16.

### Review of Literature

Muhammad Bilawal and others examines how much foreign direct investment affected on exchange rate in Pakistan. They observed that there is strong evidence that the exchange rate have significant effect on annual foreign direct investment inflows in Pakistan during the study period. They also concluded that there is strong positive correlation between exchange rate and foreign direct investment. They found that the exchange rate has 67.9 percent effect on foreign direct investment in Pakistan during the study period. So they concluded that the applied model is appropriate to predict the dependent variable.

Sreelata Biswas and Byasdeb Dasgupta have examine the relation between foreign direct investment and real exchange rate during the globalization period. They concluded that there is positive relation between real exchange rate and workers' remittances in India. They also argued that foreign direct investment has more prudent impact on real exchange rate.

Arnold Ngowani, has undertaken a study on RMB Exchange Rate Volatility and its Impact on FDI in Emerging Market Economies: The Case of Zambia. He found the mixed result between exchange rates volatilities and FDI theories and empirical studies. He argues that exchange rate volatilities negatively affected on FDI into Zambia because of the costs inherent in the volatility risks. He also found that the volatility of the RMB is relatively high having greater impact on foreign direct investment flow into Zambia. He also observe that there is negative correlation between exchange rate fluctuations and foreign direct investment into Zambia. He argues that the economic growth of China is slows down due to highly depends on exports.

Jinping Yu and Yao Cheng have conducted Empirical Study on RMB Exchange Rate on China's Inflows of foreign direct investment. They observed that wages has significant impact on the inflow of foreign direct investment in China it means

China still have comparative advantage in labor cost. The empirical results of his study concluded that there is negative correlation between the inflow of foreign direct investment and fluctuations of RMB exchange rate in China.

Anshu Grewal has found the Impact of Rupee- Dollar Fluctuations on Indian Economy. He argues that the value of currency not only affected on pride of nations but on all economic growth indicators. Devaluation of rupee reduces the inflow of FDI, rise the external debt and prices of oil. He also argues that there are huge foreign losses for Indian companies due to devaluation of Indian rupee.

### Objectives

The main object of this study is to examine the impact of exchange rate on foreign direct investment in India and China. The other particular objectives of this study are as under:

1. To study the trends in exchange rate and FDI in India and China. During 1991 to 2014.
2. To examine the impact of Exchange rate on FDI inflows in India and China.
3. To compare the empirical analysis of exchange rate and FDI of India and China.

### Research Methodology

This study is mainly based on secondary data collected from 1991 to 2014. The data regarding exchange rate and foreign direct investment was collected from the website of UNCTAD and from World Trade Organization, International Trade Statistics, 2015. For analyze impact of exchange rate on FDI the correlation and simple linear regression model used. To find linear relationship between exchange rate and FDI the following model form:

$$FDI = f(EXR)$$

$$\ln FDI = \beta_0 + \beta_1 \ln EXR$$

$\ln FDI$  = Foreign Direct Investment

$\ln EXR$  = Foreign Exchange Rate

$\beta_0$  = intercept

$\beta_1$  = The Coefficient of independent variable EXR

**Hypothesis:** Exchange rate has positive impact on foreign direct investment in India and China.

Table no. 1 presents the trends in foreign direct investment and exchange rate in India and China during 1991 to 2014. Foreign direct investment in India was US \$75 million in 1991 which goes up to US \$ 34417 million in 2014. On an average the FDI in India was US \$ 13591 million with average annual average increase of US \$ 1493.13 million per year during the study period. During the study period the average annual growth rate was 43.37 percent and the compound annual growth rate measured 29.09 percent. The exchange rate of Indian rupee in US \$ was Rs.22.74 which goes up to Rs.61.02 with average annual growth of 1.66 percent from 1991 to 2014. During the study period on an average exchange rate of Indian rupee was Rs.42.49

**Table 1:** Trends in FDI and Exchange Rates of India and China

Year	India		China	
	FDI (Mn. \$)	Exchange Rate(\$)	FDI (Mn. \$)	Exchange Rate(\$)
1991	75	22.74	4366	5.32
1992	252	25.91	11008	5.51
1993	532	30.49	27515	5.76
1994	974	31.37	33767	8.62
1995	2151	32.42	37521	8.35

1996	2525	35.43	41726	8.31
1997	3619	36.31	45257	8.29
1998	2633	41.25	45463	8.28
1999	2168	43.05	40319	8.28
2000	3588	44.94	40715	8.28
2001	5478	47.18	46878	8.28
2002	5630	48.61	52743	8.28
2003	4321	46.58	53505	8.28
2004	5778	45.31	60630	8.28
2005	7622	44.10	72406	8.19
2006	20328	45.31	72715	7.97
2007	25350	41.34	83521	7.61
2008	47102	43.50	108312	6.95
2009	35634	48.40	95000	6.83
2010	27417	45.72	114734	6.77
2011	36190	46.67	123985	6.46
2012	24196	53.43	121080	6.31
2013	28199	58.59	123911	6.20
2014	34417	61.02	128500	6.14
Average	13591	42.49	66066	7.40
CAGR	29.09	4.19	15.13	1.73
AAGR	43.37	1.66	20.55	0.04
AAI	1493.13	4.60	5397.13	1.07

Source: Unctad

With 4.19 percent compound annual growth rate during the study period. It is found that on an average Indian rupee has devaluated by Rs.4.6 per year during 1991 to 2014.

It is found from the table no. 1 the FDI of China were US \$ 4366 million in 1991 which increased by 20.55 percent per annum and reached up to US \$ 128500 million in 2014. On an average the FDI in China was US \$ 66066 million with average annual average increase of US \$ 5397.13 million per year during the study period. During the study period the compound annual growth rate is found to be 15.13 percent. The exchange rate of Chinas Yuan in US \$ was 5.32 Yuan which goes up to 6.14 Yuan with average annual growth of 0.04 percent from 1991 to 2014. During the study period on an average exchange rate of Chinas Yuan was 7.40 Yuan with 1.73 percent compound annual growth rate during the study period. It is found that on an average Chinas Yuan has devaluated by 1.07 Yuan per year during 1991 to 2014.

It observed that the during 1991 to 2014 foreign direct investment in India increased by 458.89 times in absolute term whereas, the FDI in China increased by 29.43 times in absolute terms during the same period. The exchange rate shows the 2.68 times decrease in value of Indian rupee in terms of US dollar and 1.15 times decrease in Chinas Yuan in term of US dollar during the study period. It means there is positive relationship between foreign direct investment and exchange rate.

### Correlation Analysis

Table no. 2 indicates the correlation between foreign direct investment and exchange rate in India and China. Correlation

Table 2: Correlation Analysis (FDI and Exchange Rate)

Country / Test	Correlation	P-value (2-tail)	T-test	Observations	Degrees of Freedom
India	0.6053	0.0017	3.56	24	22
China	-0.2503	0.2380	-1.21	24	22

### Regression Analysis

Table no. 3 shows the regression result of FDI and exchange rate in India and China. The regression analysis has been used to show the accuracy between dependent and independent variables. The regression result of this study shows the R-square value is 0.3664 percent it means the

used for analyze relationship between two or more variables and its range between - 1 to +1 and the significant level is 0.01 to 0.05 percent more than 0.05 significant value shoes insignificant relationship between two variables. The -1 correlation value shows perfect negative relationship and in the opposite + 1 correlation value shows perfect positive relationship between two variables. The correlation between foreign direct investment and foreign exchange rate for India is to be found 61.53 percent at significant level of 0.1 percent indicating the significant positive relationship between foreign direct investment and exchange rate in India. The positive correlation of 0.6053 at significance level 0.0017 percent with 99 percent confidence level suggest to accept the hypothesis that the positive relationship between foreign direct investment and exchange rate in India during the study period.

The correlation analysis shows negative correlation between foreign direct investment and exchange rate in China. It is found that the correlation between foreign direct investment and exchange rate is -25.03 percent at the significant level of 23.8 percent during 1991 to 2014. Trend in FDI shows 1.54 times increase in FDI during the study period. It means the negative correlation shows indirect correlation between FDI and exchange rate in China. The negative correlation -0.2503 at  $p = 0.238$  with 76.2 percent confidence level between foreign direct investment and exchange rate in China suggest to reject the hypothesis.

model is insignificant. But, the R value shows the one unit increase in exchange rate will raise 0.605 units in foreign direct investment in India during 1991 to 2014. It is found that the independent variable exchange rate affects by 36.64 percent on dependent variable foreign direct investment in India.

**Table 3:** Regression analysis

Country / Test	Multiple R	R-squared	DW-Test
India	0.6053	0.3664	0.4438
China	-0.2503	0.0627	0.0903

The result of regression analysis shows the negative effect of exchange rate on foreign direct investment in China. In case of China regression result of this study shows the R-square value is 0.0627 percent it means the model is highly insignificant. But, the R value shows the one unit increase in exchange rate will leads to decrease 0.2503 units of foreign direct investment in China during 1991 to 2014. It is found that the independent variable exchange rate affects by 6.27 percent on dependent variable foreign direct investment in China.

#### Anova Result

In the analysis of Anova the F value is mostly considered with significant level of 0.01 to 0.05 percent. The significant level 0.01 to 0.05 percent shows the reliable affect on dependent variable. In this study the P value 0.0017 indicates highly significant level which shows higher level of significant between exchange rate and foreign direct investment in India. As per anova analysis the P value 0.0017 indicates that the coefficient of exchange rate variable is highly significant with FDI in case of India. The P value 0.238 indicates that the exchange rate variable does not exert significant influence of FDI in case of China (table no 4).

**Table 4:** Analysis of Variance (Multiple Linear Regression Model)

Country / Test	Degree of Freedom	F-Test	Sig.
India	22	12.75	0.0017
China	22	1.47	0.2380

#### Conclusion

India and China are the emerging economies in the world. These two countries have about 37.5 percent population of the World. This study was conducted to examine the impact of exchange rate on foreign direct investment in India and China. For analyzing impact of exchange rate on FDI the correlation and regression analysis techniques have been used. It observed that the during 1991 to 2014 foreign direct investment in India increased by 458.89 times in absolute terms whereas, the FDI in China increased by 29.43 times in absolute terms during the same period. The exchange rate shows the 2.68 times decrease in value of Indian rupee in terms of US dollar and 1.15 times decrease in Chinas Yuan in term of US dollar during the study period. It is found that there is positive correlation between FDI and exchange rate in India. For China the correlation between FDI and exchange rate is negative. It is observed that one unit increase in exchange rate will raise FDI by 0.605 units in India. In case of China one unit increase in exchange rate will leads to decrease of FDI by 0.2503 units during the study period. The P value 0.0017 indicates that the coefficient of exchange rate variable is highly significant with FDI in case India. The P value 0.238 indicates that the exchange rate variable does not exert significant influence of FDI in case of China. This study observes that the exchange rate highly correlated to FDI in India. So it is suggested that China should adopt fluctuated exchange rate policy like India. On an average the Chinas foreign direct investments are 4.86 times more than India during the study period. So it is suggested India should adopt effective policy measures to

attract FDI for generating new employment for educated youths.

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