

Misalignment between Foreign Exchange Rate
and Fundamental Variables: A Comparative
Study of India, China and USA

SUMMARY OF DISSERTATION

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1. Introduction:

The word globalization means free trade or free movement of goods and services all over the world in an integrated manner. Nowadays as economies are getting more integrated with the world economy and indulging more into extensive trade and capital flows with countries all over the world due to globalisation. Foreign exchange rate plays an important role as it determines the competitiveness of goods and services in the global markets, and affect the currency value. In 1973 exchange rates became much volatile after the collapse of Bretton Wood system. Due to exchange rate volatility lot many researches has been undertaken to understand the behaviour of exchange rate movements. The exchange rate is the price of domestic currency relative to foreign currency. As exchange rate determines the competitiveness of goods and services, the exchange rate has a direct impact on international prices of goods and services as well as financial assets, the value of currencies in terms of foreign currencies are essential in determining exports and imports of countries and the exchange of financial assets in global market according to various researchers, economists etc. The determinants of exchange rate are classified as short run and long run. Long run factor are linked with goods market and labour market whereas short run factors works through the changes in domestic and international financial markets. Inflation rate differentials, differences in domestic interest rate and foreign interest rate or expected future exchange rates all have an impact on current exchange rate in the short run. As inflation drops down domestic interest rate rises or foreign interest rate falls, they all lead to increased demand for the domestic currency; consequently the currency value increases or appreciates. Conversely as the demand for currency decreases in a domestic or global financial market, the currency value will lose its value relative to other currency. The long run factors determining exchange rate are trade policies, differences in price levels of products in domestic versus foreign countries, differences in productivity and preferences for foreign versus domestic products.

2. Definition of Exchange rate Misalignment:

When exchange rates do not follow the fundamental variables of a country, it is called exchange rates misalignment. Exchange rate misalignment can be harmful for the

growth of an economy, and if it persists, it may result in macroeconomic imbalances that may lead to macroeconomic crises and especially when it is beyond certain threshold value. The Exchange rate forecast plays a important role for policy maker to determine the output and inflation in the economy. As markets are globalised nowadays exchange rate misalignments are pretty much focussed in recent years.

As there are determinants of exchange rate various researches have been done on the deterioration of exchange rate misalignment. Going through various research papers few determinants of exchange rate misalignment are stated as under:

- The degree of freedom or openness.
- The nature of global specialization.
- The exchange rate regime along with the degree of financial liberalization.

The global financial crisis shone a spotlight on the US dollar as a pivot in international finance as it gave rise to a dollar shortage in 2008 more acute than that of the 1950s. The US authorities relieved the dollar shortage by entering into dollar swaps with central banks on an unprecedentedly broad scale and, with major central banks, in unlimited amounts (CGFS 2010). Before long, market concerns switched to possible excess dollar liquidity as the US Federal Reserve carried out repeated programs of large-scale bond purchases. The temporary dollar shortage and the subsequent worries over a dollar glut served to highlight the dependence of the international financial system on a currency subject to national management. In particular, the crisis put at risk international trade between countries outside the United States as banks in either country had difficulty rolling over dollar liabilities in the interbank market in order to finance their trade. More recently, economies outside the United States have tried to build dams to divert dollar inflows away. To a system engineer, it might appear to be a negligent design that left such a ‘single point of failure’ in the international financial system. Against this backdrop, a number of recent policy initiatives suggest that the Chinese authorities have adopted a proactive strategy to promote the international use of the Renminbi (RMB). Because the case of China is a very interesting example of understanding the power of the exchange rate in determining trade and growth trends of countries, the focus is on this country. Since the United States is the largest trading partner of China, it is the most affected country

by China's misaligned currency. Different actions are taken in the U.S. to smooth these negative effects. For example, there have been numerous calls by the international community led by Mr. Charles Schumer; a Democratic senator from New York, who has been active in searching for new congressional actions against China's perceived undervalued currency and trade policies since 2004. ^[1]

Due to globalization exchange rate misalignments are pretty much focused and started to attract more attention in recent years. Recently India, China and USA are best examples of currency misalignment. In these countries exchange rates are not following the fundamental variables. Though China is doing well on global grounds then too its currency is devaluating since 1990s. This study investigates the misalignment between foreign exchange rate and the fundamental variables of India, china, and USA. This is the introductory chapter of the study so we will mention the research gap, scope of the study, objective of the study, Hypothesis and methodology, and the chapterisation of the study.

3. Review of Literature:

After the pioneering work of Balassa (1964) and Samuelson (1964) research on real exchange rate and currency misalignment proceeded in two related, but in distinct direction. The first is to measure currency valuation that is to estimate an "equilibrium" level of real exchange rate. The second is to apply currency valuation estimates to models explaining economic growth and specifically to estimate the deviation of economic growth from the equilibrium RER which is called misalignment or over and under valuation of the currency.

Bhalla (2002) found changes in the real exchange rate to be significant explanatory variable for growth acceleration – the greater the change in real exchange rate, the higher the acceleration in the per capita growth rates. The Balassa Samuelson thesis — that real exchange rate increases with per capita income – was confirmed for a number of countries, especially developed economies including Japan. So it is a belief that exchange rate increases with the acceleration of macro variables.

Charles Engel and Kenneth D. West (2005) argues that fundamental variables such as relative money supplies, outputs, inflation, and interest rates provide little help in predicting changes in floating exchange rates.

In the study of Nihal Bayraktar it is illustrated that when global economy came under real stress in 2008, Chinese economic growth dropped precipitously from 13 percent to 6 percent. But only after 12 months growth was back up by 12 percent. Other countries dropped by 30 percent where as in case of China it was just 15 percent in 2008-09 and the effect of the global downturn lasted only 12 months.

N R Bhanumurthy (2006) presents the study that investigates the relative importance of macro and micro variables in determining the exchange rate movements in India. In this study he works on primary data collected from the Indian foreign exchange dealers. In 2004 he presented the same issue worked with secondary data. N R Bhanumurthy illustrated in his study that fundamental variables are significant for long and medium run.

Parthapratim Pal and Partha Ray (2018) presents in their commentary that downfall of Indian rupee is due to global factors and huge dependency of oil imports. And the situation is not as bad as 2013. India's currency has indeed depreciated with respect of all four major currencies since April 2018.

As per the data of trading economics the inflation rate of India is lowest since 2014. GDP annual growth rate of India averaged 6.18 percent from 1951 until 2018 reach an all time high of 11.40 percent in the first quarter of 2010. Interest rate is averaged 6.66 percent from 2000 till 2018. So we can see from the above data that though India is performing well in terms of growth but its currency is depreciating since 1951. So the belief that exchange rate moves in the direction of macro variables is being violated.

Sophie Berau, Antonio Lopez Villavicencio, Valerie Mighou (2009) in their study of currency misalignment and growth shows that the impact of exchange rate misalignment on economic growth depends upon the size and sign of the misalignment. They find that there exists positive relation between foreign exchange misalignment and economic growth when currency is undervalued whereas overvaluation negatively affects the economic growth.

Cecile Couharde, Andrey Sallenave (2013) in their journal found that undervalue currencies led to reversal of growth. They determine the threshold value of

misalignment. A level of 18.69 percent being benefit in terms of growth, beyond this effect is contractionary.

Martin Rapeti (2013) analysed the mechanism of currency misalignment. According to this study there are two mechanism of currency misalignment.

- Financial globalisation channel
- Tradable led growth channel

Both mechanism are not mutually exclusive, both might have some explanatory variables.

Geoffrey Garret (2011) presents the study in which he illustrated the US—Chinese economic relation after global financial crises. In that he depicted the position of US economy. Though US economy is not doing well in terms of growth still its currency is appreciating since long. Its employment rate is decreasing and its GDP growth rate is also decreasing. Inflation rate is also falling since long. On the other hand when we come to US Dollar index it is increased from 0.27 percent to 95.84 percent.

Adhiraj Arora et al. Attempted to understand the dynamics of Indian rupee fluctuations against US Dollar by using average quarterly observations over the period of 21 years. They also made an attempt to identify the key variables that influence exchange rate movements. After applying OLS and performing unit root and co integration tests, they observed that factors like differential interest rates, differential inflation rates, differential money supply in both the markets, differential output growth rates of both the countries, among others, are important factors that account for approximately 91 percent variance of the Dollar Rupee exchange rates and explain the exchange rates dynamics to a large extent. They also observed that after checking for auto correlation and applying FGLS, a few factors that were earlier considered to be important are not as significant as expected.

Jaroslav Mida aims to forecast the USD/EUR exchange rate using four macro economic variables, namely inflation, interest rate, unemployment rate and industrial production index. The model applied vector autoregressive model and he used monthly data for a period of 2002 to 2011 and used the data from 2012 in order to

compare the forecast accuracy with the random walk, which is believed to outperform many models when forecasting for a short time horizon, such as one year.

A paper of Jarko Jaskella and Mariano Kulish analyses some implications of indeterminacy of the rational expectations equilibrium for a small open economy. In the canonical sticky price small open economy model, he found that indeterminacy arising in the large economy can increase the volatility of the small economy. Their main findings, however, is that smallness is a property of the unique rational expectations equilibrium of the large economy, and not a general property of the small open economy model. If the large economy fails to anchor expectations, shocks to the small economy can affect large one. This form of indeterminacy gives rise to a “butterfly effect”. They show that fundamental shocks to small economy can act like non fundamental shocks for the large economy.

4. Scope of study

Many researches have been done with currency misalignment, and these studies said exchange rate follows the growth rate but there is significant study that shows exchange rate is not following the fundamental variables. This study investigates the misalignment between foreign exchange rate and fundamental variables and it compares the data of three countries viz. India, China and USA where currency misalignment can be seen. Nowadays these three countries gained popularity due to its misalignments. This will be the first study that compares India, China and USA misalignments and considers misalignment between foreign exchange rate and fundamental variable as short run phenomenon.

5. Objectives of the Study

To study the pattern of movement of fundamental variables in case of India, China, and USA.

- In the context of movement of fundamental variables, to explore the variation in exchange rate of these countries.
- To study the pattern of misalignment between performance of fundamental variables and exchange rate determination.

6. Hypothesis

- Fundamental variables of India, China and USA have shown almost similar trend in the post reform period i.e. 1991.
- Variation in exchange rate of these countries follows the movement of fundamental variables.
- Misalignment between fundamental variables and exchange rate of these countries are short run phenomena and in the long run it corrects the misalignment in itself.

7. Methodology

In order to analyse the misalignment between foreign exchange and fundamental variables of India, China and USA secondary data will be used from the year 1991-2017. Various surveys, journals, books, and research articles will be used for the support of review. The method which will be used for assessing the impact of fundamental variables on exchange rate is trend analysis, basic statistical tool and linear regression models with dummy variable to mention the representative variable of fundamental variables and the pattern of misalignment between fundamental variables and exchange rate of these countries. For this analysis our base theory is Exchange rates in long run and short run.

7.1. Exchange Rates in Long Run and Short run

Like any other goods and services, exchange rates are also determined by the interaction of supply and demand.

Factors affecting exchange rate in long run

- Price level
- Preferences for Domestic versus Foreign Goods
- Productivity

Factors affecting exchange rate in short run

- Foreign interest rate
- Domestic interest rate

In this study the data from 1991 till 2017 is included and it is subdivided into two period viz. normal period and recessionary period. In these periods we will analyse the recession period and normal period and try to find out the differences in the behaviours of fundamental variable and foreign exchange rate in the recession and normal period. For normal condition value is 0 and recession period value is 1.

7.2. Sub period I

It includes four periods 1992-1996, 1999-2000, 2003-2006, and 2010-2017, all these periods are normal period. In sub period I all the normal periods are included and calculating the variations between foreign exchange and fundamental variables in the normal period respective to all the three economies.

7.3. Sub period II

It includes all the recessionary period i.e. 1991, 1997-1998, 2001-2002, and 2007-2009. In sub period II variations between foreign exchange rate and fundamental variables has been calculated through trend analysis.

Firstly I collected secondary data regarding the movement of fundamental variables in the post reform period of India, China and USA and then compare it with the help of trend analysis then try to analyze whether these countries accounted for similar patterns of movements in fundamental variables. Secondly I will analyse the variation (if any) in exchange rate with respect to movement of fundamental variable with the help of trend analysis and then finally find out the misalignment between performance of fundamental variables and exchange rate determination by using fixed effect LSDV model in order to prove the study empirically. I have used four models in order to the misalignment which are as under:

We base this empirical study on the pattern of misalignment in India, China and USA. The main question of this chapter is whether and how far exchange rate appreciates or depreciates change in fundamental variables of the respective country.

7.4. Variables

For our analysis we identify four independent variables as follows:

- Inflation rate
- Interest rate
- GDP growth
- Trade balance or current account balance

Here the dependent variable is SDR.

7.5. Data sources

We consider annual data for the four independent variables mentioned above for a period of 27 years (1991-2017). Also, data for the dependent variable is considered for the same period. We obtained the data from various sources like World Bank Development Index, IMF's e-library data etc.

7.6. Tests

Since the data we have is panel data, we first check the unit root problem in all the variables. The unit root tests will be used to check the stationarity of the data. For this, we apply Hadri LM unit root test on each variable to check whether each of these variables is stationary or not.

Hypothesis of Hadri LM test:

H₀: All panels are stationary.

H₁: Panel contains unit root

Now we use fixed effect LSDV model to be estimated as follows:

$$ER = f(GDP, Interest Rate, Inflation, CAB)$$

For tracing the currency misalignment with respect to GDP we define the model to be estimated as follows:

$$ER = \beta_0 + \beta_1GDP + \beta_2D_2 + \beta_3D_3 + \beta_4GDPD_2 + \beta_5GDPD_3 + u_i \dots \dots (1)$$

Where

ER = Exchange Rate

β_0 = Intercept

β_1GDP = GDP of reference country {Reference country is India}

β_2D_2 = Dummy variable {Dichotomous; 1= China, 0= others}

β_3D_3 = Dummy variable {Dichotomous; 1= USA, 0= others}

β_4GDPD_2 = GDP of D_2

β_5GDPD_3 = GDP of D_3

For tracing the currency misalignment with respect to interest rate we use the model to be estimated as follows:

$$ER = \beta_0 + \beta_1Int + \beta_2D_2 + \beta_3D_3 + \beta_4IntD_2 + \beta_5IntD_3 + u_i \dots \dots (2)$$

Where

ER = Exchange Rate

β_0 = Intercept

β_1Int = Interest rate of reference country {Reference country is India}

β_2D_2 = Dummy variable {Dichotomous; 1= China, 0= others}

β_3D_3 = Dummy variable {Dichotomous; 1= USA, 0= others}

β_4IntD_2 = Interest rate of D_2

$\beta_5 \text{Inf}D_3 = \text{Interest rate } D_3$

For tracing the currency misalignment with respect to inflation we use the model to be estimated as follows:

$$ER = \beta_0 + \beta_1 \text{Inf} + \beta_2 D_2 + \beta_3 D_3 + \beta_4 \text{Inf}D_2 + \beta_5 \text{Inf}D_3 + u_i \dots \dots \dots (3)$$

Where

ER = Exchange Rate

β_0 = Intercept

$\beta_1 \text{Inf}$ = Inflation in reference country {Reference country is India}

$\beta_2 D_2$ = Dummy variable {Dichotomous; 1= China, 0= others}

$\beta_3 D_3$ = Dummy variable {Dichotomous; 1= USA, 0= others}

$\beta_4 \text{Inf}D_2$ = Inflation in D_2

$\beta_5 \text{Inf}D_3$ = Inflation in D_3

For tracing the currency misalignment with respect to current account balance we use the model to be estimated as follows:

$$ER = \beta_0 + \beta_1 \text{Cab} + \beta_2 D_2 + \beta_3 D_3 + \beta_4 \text{Cab}D_2 + \beta_5 \text{Cab}D_3 + u_i \dots \dots \dots (4)$$

Where

ER = Exchange Rate

β_0 = Intercept

$\beta_1 \text{cab}$ = Current account balance of reference country {Reference country is India}

$\beta_2 D_2$ = Dummy variable {Dichotomous; 1= China, 0= others}

$\beta_3 D_3$ = Dummy variable {Dichotomous; 1= USA, 0= others}

$\beta_4 \text{cabD}_2$ = Current account balance of D_2

$\beta_5 \text{cabD}_3$ = Current account balance D_3

Basically there are three chapters, two core chapters and a main chapter, in the first core chapter pattern of movement of fundamental variables of the three economies has been analysed. In the second core chapter variations in exchange rate with respect to the movement of fundamental variable of India, China and USA has been analysed through trend analysis and descriptive statistical tools. In the final and main chapter i have used four models to interpret the result of the analysis regarding pattern of misalignment between foreign exchange and fundamental variables of the respective countries.

8. Chapter Plan

This study is organised in six chapters which is as under:

- Introduction
- Conceptual And Theoretical review.
- Pattern of movement of fundamental variables in the post reform period: A comparative analysis of India, China, and USA.
- Analysis of variation in exchange rate with respect to movement of fundamental variables.
- Pattern of misalignment between performance of fundamental variables and exchange rate determination.
- Conclusion and policy prescription.

9. Conclusions

The study aimed to identify the misalignment between foreign exchange rate and fundamental variables with respect to India, China and USA from 1991 to 2017. Here misalignment is when exchange rate does not follow the fundamental variables. There are many researches that focused currency misalignment, but as of now no study compares the misalignment of India, China and USA and considers determination of exchange rate through fundamental variables as a short run phenomenon, though these countries are great examples of currency misalignment. Exchange rates are very much

volatile due to the collapse of Bretton Wood system in 1973. Since then lot many researches has been undertaken to understand the behavior of exchange rate movements. The exchange rate is the price of domestic currency relative to foreign currency. Since the exchange rate directly affect international prices of goods and services and financial assets, the relative value of currencies are of great importance in determining exports and imports of countries and the exchange of financial assets in global market according to various researchers, economists etc. Exchange rate misalignment may be harmful for relative price due to “unsound economic policies”. If it persists may indicate the presence of macroeconomic imbalances that may lead to macroeconomic crises and especially when exceed beyond certain threshold value, disruptive exchange rate adjustment. Exchange rate forecast is quite necessary for policy maker to determine the output and inflation in the economy. As markets are globalised nowadays exchange rate misalignments are pretty much focused in recent years. China is a very interesting example for understanding the importance of the exchange rate in determining trade and growth trends of countries, the focus is on this country. As the United States is the largest trading partner of China, so it is the most affected country by China’s devalued currency. Because of their trade war developing countries like India is also affected by it. This study revolves around three objectives, first is to study the pattern of movement of fundamental variables of the respective countries, and second is to analyze the variation in exchange rate with respect to fundamental variables of the respective countries, third and final objective is to study the pattern of misalignment between fundamental variables and exchange rate determination. All the data in this study is secondary data and its main sources are IMF e library and world development indicator of World Bank. The methodologies that I have used here are trend analysis, basic statistical tools (average, min, max and variance) and linear regression with dummy variables. So, this study is divided into two core chapters and a main chapter.

The objective of first core chapter is to trace the pattern of movement of fundamental variables of India, China and USA and its hypothesis is fundamental variables of India, China and USA have shown almost similar trend in the post reform period i.e. 1991. The fundamental variable that is included in the chapter is GDP growth, interest rate, Inflation and current account balance of the three countries. In order to show the movements of fundamental variables of respective countries trend analysis and basic

statistical tools has been used. The time period are divided into two sub-periods viz. normal and recessionary period. Through trend analysis and basic statistical tool we find that these countries do not show similar trends in terms of movement in fundamental variables. As we all know that China is one of the emerging and fastest growing economies of the world so Chinese economy is performing very well in terms of its fundamental variables while India is also performing well but USA economy is stagnant in terms of its fundamental variables although it is one of the developed and strongest economy of the world. After comparing the three economies it is concluded that India and China is growing swiftly in terms of its fundamental variables of economic growth. On the other hand economic growth of US economy is not performing well as compared to India and China. After the reforms China is the fastest growing economy of the world and India is an emerging economy and is performing well in terms of economic growth. In terms of recessions India and China were affected by 1998 recession while US economy was adversely hit by the global financial crises and dot com bubble burst. The variance was least in USA with respect to the movement of fundamental variables which proves that its fundamental variables are not performing. At the same time India and China showed variations with respect to the movement of fundamental variable. So we can conclude that the fundamental variables are of the three economies are following dissimilar trend and affecting differently by recessions.

The purpose of the second core chapter is to observe the variation between fundamental variable and exchange rate determination. The hypothesis for this chapter is variation in exchange rate of these countries follows the movement of fundamental variables. In this chapter we divide our comparisons in three parts, firstly we compare China and India then we compared USA with India and lastly we compared USA and China and the basis of comparisons is differences in the movement of fundamental variables. In this chapter also we used the same technique as in Chapter 3, i.e. trend analysis and basic econometric tools; at the same time we also used the differentials of fundamental variables of the respective countries and their exchange rate to analyze the variations. Our main finding of the chapter is the variation in exchange rate is not as per the movement of fundamental variables. Various theories, articles and journal already tell us the relationship of variable with exchange rate and which variable determines the exchange rate of a country. On the

contrary GDP growth and inflation determines the exchange rate in the long run whereas CAB and interest rate determines the exchange rate in the short run as it is a part of money market and money market respond faster than goods market. On the behalf of the descriptive statistical tools used in analyzing the variation, we can conclude that there are movements in fundamental variables of China and India while we cannot observe much variation with respect to the movement of fundamental variables of USA. When we compare the productivity differential, interest rate differentials, price level differentials, CAB differentials of China and India we analyzed that the variance value of all four differentials are moving up and down with the time but we cannot analyze much variance in their exchange rate. Similarly, we compared India and USA all the four differentials were varying with time but exchange rate of both the countries was showing high variance in their exchange rate especially during 2010-2017. And the movements of exchange rate between these two countries are much higher than the movement of their fundamental variable. At the same time we can also observe the same thing in the trend analysis too India's SDR was high while USA's SDR was stagnant though their fundamental variables were moving, things are beyond theory. As per theory of determination of exchange rate in long run and short run INR should appreciate as the movement of its fundamental variable was in favor of appreciation, while USD should depreciate as its fundamental variable was against appreciation. Lastly we compared USA to China, from the trend analysis we can notice that USA's SDR was constant while China's SDR was moving up and down with the time but the movement was very slight especially after 1995. Now when we talk of their fundamental variables we analyzed that China's currency should be appreciated and USA's currency should be depreciated with respect to the movement of their fundamental variables but scenario is just opposite to the theory. On the behalf of basic statistical tool we can analyze that the four differentials variations were high but we cannot analyze much variation in their exchange rates, even its variance value was 0 from 1999- 2006.

Now the main and final chapter, it aimed to show the pattern of misalignment between performance of fundamental variables and exchange rate determination. Here independent variables are GDP growth rate, interest rate, inflation and current account balance and dependent variable is SDR of the respective countries. Firstly unit root tests are applied to each independent variable to check the stationarity, from Hadri

LM unit root tests we get to know that data are stationary at first difference so we can use original data as they are of same order as stated in the theory of co integration. Then fixed effect LSDV model is used to find the results, in this we used dummy variables and linear regression to interpret the results, four models for each independent variable are used to estimate the result. The hypothesis of the chapter is misalignment between fundamental variables and exchange rate of these countries is short run phenomena and in the long run it corrects the misalignment in itself. The main findings of this study are: In India the GDP growth and inflation are significant at 10 percent level of significance while CAB and interest rate are insignificant. But in case of USA and China all the four fundamental variables are insignificant which we can see from p value of regression result. On the other hand when we talk of exchange rate determination with respect to the movement of four fundamental variables i.e. GDP growth, interest rate, inflation and CAB only interest rate of all three economies supports the theory rest of three variables are not supporting the theory. So from the empirical analysis we can say that in determining exchange rate there are some artificial interventions which deviates the exchange rate movement with respect to the movement of fundamental variables. As a result we can say that exchange rates do not follow the movement of fundamental variables and currency misalignment is present in case of all the three economies. The data which is observed here is a long period but still we can observe that there is misalignment, so we can say that misalignment in long run do not correct itself rather it exists in long run too. There is misalignment between movement of fundamental variables and exchange rate determination and this misalignment does not correct itself in long run rather it is present in long run as well as in short run.

10. Policy Prescription

1. In the context of increasing share of International trade of world GDP, It is recommended to establish a strong, stable and legal International currency system.
2. International currency system must be linked to fundamental macro variables of world economy. Further, fundamental variables of world economy must be

fairly defined and linked to fundamental real variables of different countries/economies.

3. For establishing a fair International currency system, there must be strong, vibrant and self-dependent International institutions/world organisations.
4. Institutions like IMF, World Bank, UNO must be strengthened and they must work like word government/ institution in real sense.

11. Suggestions for future research

In this study we examined that there are some external factors that deviates the exchange rate determination and the movement of fundamental variable in the long run.

1. What are those external factors that affect exchange rate determination and movement of fundamental variable in the long run?
2. To what extent these external factors affect the exchange rate determination.

12. Limitations of the Study

In spite of being very thorough and executed the study with a well-defined methodology, the design of current study is subject to certain limitations that could be addressed in future which are given below:

5. While collecting the data from data source, some data of US economy was missing, so we used Average method to overcome the difficulty.
6. We have used some trading sites to fetch the data of exchange rate of India and China because this Data is unavailable on IMF and World Bank.
7. We can also use the differentials of independent variables i.e. interest rate differential, Growth differential, Export differential and price level differential.