International Journal of Academic Research and Development
ISSN: 2455-4197, Impact Factor: RJIF 5.22
www.academicsjournal.com
Volume 2; Issue 2; March 2017; Page No. 80-84

The impact of exchange rate fluctuations on the economic growth of India

Dr. VB Khandare

Associate Professor of Economics, Shri. Asaramji Bhandwaldar College, Deogaon (R.) Tq. Kannad, Aurangabad, Maharashtra, India

Abstract
In the globalization period exchange rate is the crucial factor affecting on economic growth of every country. This study is undertaken to examine the impact of exchange rate on economic growth of India during 1987 to 2014. According to standard deviation it is observed that the GDP growth is more consistent than exchange rate, interest rate and inflation rate during the study period in India. The coefficient of correlation 0.230 indicates that the correlation between exchange rate and GDP growth is positive but not significant. But the interest rate and inflation rate have inverse effect on economic growth of India during the study period. It is observed form the study that the exchange rate and interest rate has negative but not significant impact on economic growth of India (Showing β = -0.087 and t = -1.389 and β = - 0.707, t = - 2.327 respectively) during the study period. But it is found that the inflation rate has positive but not significant impact on economic growth of India with (β = 0.029, t = 0.2012). Correlation analysis shows positive but multiple regression analysis shows negative relationship between exchange rate and GDP growth in India during the study period.

Keywords: Exchange Rate, Inflation Rate, Interest Rate, GDP

1. Introduction

Exchange rate is the rate of one currency in term of another currency of the any country. The exchange rate determines by the International Monetary Fund in the value of US dollar. Initially the Special Drawing Rights defined equal to 0.888671 grams of fine gold and which is equal to one American dollar. Today exchange rate determines by the International Monetary Fund with the help of basket currencies which includes US dollar, Japanese Yen The exchange rate is a key financial variable that affects decisions made by foreign exchange investors, exporters, importers, bankers, businesses, financial institutions, policymakers and tourists in the developed as well as developing world. Exchange rate fluctuations affect the value of international investment portfolios, competitiveness of exports and imports, value of international reserves, currency value of debt payments, and the cost to tourists in terms of the value of their currency. Movements in exchange rates thus have important implications for the economy's business cycle, trade and capital flows and are therefore crucial for understanding financial developments and changes in economic policy (Pami Dua and Rajiv Ranjan).

Exchange rate is the combination of two words: rate and exchange. Rate refers to the value/price at which transactions take place, and exchange is the process of buying and selling. The process of buying and selling necessitates determination of price of commodities or service entailed in exchange. Price of money/currency also behaves like commodity prices. Prices of goods and services are determined in terms of money, value of money, in turn, is shown in quantities of goods and services that money can buy. The domestic price of national currency is expressed by its purchasing power of goods and services in the market. Similarly, external value of national currency may be expressed by its purchasing power of in terms of goods and services in foreign market. But currency of one country is not accepted as medium of exchange in other countries. So, domestic currency has to be converted in to foreign currency in foreign exchange market. The conversion rate is defined as exchange rate. Purchasing power of national currency in foreign markets is expressed in foreign currency, generally US dollars, Euro or a basket of 10 currencies. The foreign currency is the medium of exchange in external market. Exchange rate is the external price of domestic currency. Purchasing power of foreign currency in national market is measured in domestic currency (Prakash and Rekha Sharma).

There has been considerable evolution in India's exchange rate regime over the reform years. The shift has been from a nominal fix to one-way nominal movement over the nineties to two-way with low volatility implying a tightly managed exchange rate, to greater volatility and nominal movement after the global crisis. The paper infers the exchange rate regime and the Government's objectives from changing INR trends and volatility over the reform period, in the context of the fundamental determinants of exchange rates. Concerns to prevent appreciation given a trade deficit, large but volatile inflows, and higher Indian inflation led to reserve accumulation, a tendency for nominal depreciation, and relative constancy of the real exchange rate around the real effective exchange rate (REER) established after the double devaluation in the early nineties. A watershed was the reversal of trend nominal depreciation in 2003. Then the beginnings of two-way movement in the managed float, even while large foreign exchange reserves were accumulated. The latter helped reduce risk perceptions and outflows in the period of the global crisis. Outflows did occur although they were quickly reversed. With less intervention, probably due to a precautionary motive to

conserve reserves in a time of great uncertainty, there was much more nominal and real exchange rate volatility (Ashima Goyal).

1.1 Review of Literature

In the international finance literature, various theoretical models are available to analyze exchange rate determination and behavior. Most of the studies on exchange rate models prior to the 1970s were based on the fixed price assumption (Marshall (1923) [16]. With the advent of the floating exchange rate regime amongst major industrialized countries in the early 1970s, an important advance was made with the development of the monetary approach to exchange rate determination. The dominant model was the flexible-price monetary model that has been analyzed in many early studies like Frenkel (1976) [11], Mussa (1976, 1979) [17, 18], Frenkel and Johnson (1978) [10], and more recently by Vitek (2005) [27], Nwafor (2006), Molodtsova and Papell, (2007) [16]. Following this, the sticky price or overshooting model by Dornbusch (1976, 1980) [8, 9] evolved, which has been tested, amongst others, by Alquist and Chinn (2008) [1] and Zita and Gupta (2007) [28].

Jayachandran conducted a study on The Impact of Exchange rate on Trade and GDP for India a Study of Last four decade. This research has provided empirical estimates of the Economic relationship between Exchange Rate, Inflation, Government Revenue and Income growth in India. In the long-run the exchange rate and income may not drift apart, but in the short run their relationship is weak and indirect. Together these results provide confirmation that there is no evidence of a strong direct relationship between changes in the exchange rate and GDP growth. Rather India's Economic growth has been directly affected by fiscal and monetary factors.

Saleh Mohammed and Shyamapada Biswas, examines the Exchange Rate and Its Impacts on GDP and Inflation in Bangladesh. In this paper they compares the economic track records of the two different exchange rate regimes the "Fixed Exchange Rate" and the "Free Floating Exchange Rate System" in maintaining economic performance. They also consider relationships between exchange rate and Inflation and between exchange rate and GDP in Bangladesh. Bangladesh experiences of moving away from a currency board system to floating regime since 2003 offers a lesson worthy of attention from the point of view of efficiency of "Floating Rate System" in least developed countries like Bangladesh.

Khondker, Bidisha, Razzaque (2012) [14] have conducted a study on The Exchange Rate and Economic Growth: An Empirical Assessment on Bangladesh. This study has made an attempt to examine the effects of exchange rate changes on Bangladesh's aggregate output, measured by GDP. They concluded that the estimated real exchange rate elasticity's lie in the range of 0.24 – 0.42 with our preferred estimates being 0.24 – 0.28. That is, a 10 per cent real depreciation of taka would lead to 2.4% to 2.8% increase in GDP. However, in the short run, the impact of devaluations is likely to be contractionary. The effect is small: a 10 per cent real devaluation is associated with just above half a per cent decline in GDP.

Martin Rapetti, Peter Skott and Arslan Razmi, have examine the Real Exchange Rate and Economic Growth: Are Developing Countries Different? They observe that the additional and more conclusive evidence comes from interacting the index of RER undervaluation with the level GDP per capita. This strategy shows that the effect of currency undervaluation tends to decrease with the level of GDP per capita. However, the decrease is not monotonic as Rodrik suggests.

Consistent with his results, the effect of undervaluation on growth appears to be largest for very poor countries, but our results also suggest that it is sizable for middle-income countries as well.

Stotsky, Ghazanchyan, Adedeji, and Maehle, examines the relationship between the foreign exchange regime and macroeconomic performance in Eastern Africa. They found that lagged inflation, broad money growth and fiscal position are key macroeconomic determinants of inflation. They observe that the actual exchange rate regime in place, with flexible and intermediate foreign exchange regimes producing lower inflation than the pegged exchange rate regime. They also found the evidence of a significant relationship between exchange rate movements and inflation, there is no evidence for full pass-through, both in the short and long run.

Adeniran, Yusuf, Olatoke have examined the impact of exchange rate on economic growth from 1986 to 2013. They observe that the exchange rate has positive impact but not significant with (β =0.014, t = 1.783, Pns) this is affirms previous studies that developing countries are relatively better off in the choice of flexible exchange rate regimes. They also found that the interest rate and rate of inflation have negative impact on economic growth but not significant with (β = - 0.002, t = - 0.015, Pns) and (β = -0.023, t = - 0.716, Pns) respectively. From the empirical reviewed work, some authors argued that exchange rate is positively related to economic growth, while some authors argued that it is negatively related.

1.2 Research Methodology

The present study is based on secondary data. The secondary data regarding GDP growth rate, Exchange rate, Interest rate and Inflation rate were collected from World Bank Data Publication. The required data collected for the period 1987 to 2014. For analyzing growth performance of macroeconomic indicators average and compound annual growth rate has been used. The models used in this study are estimated using annual Indian data on some macro-economic indicators, which includes: Gross Domestic Products (GDP); Exchange Rate (EXR); Interest Rate (INR) and Inflation Rate (IFR) for the period 1987 to 2014. The correlation and multiple regression analysis of the ordinary least square (OLS) are used to determine the impact of exchange rate on economic growth of India.

For determine the impact of selected macroeconomic indicators on economic growth of India the specifies model formulated as under;

GDP = f (EXR, INT, INF)

GDP = β0 + β1 EXR + β2 INR + β3 INF

GDP = Gross Domestic Product

EXR = Exchange Rate

INR = Interest Rate
INF = Inflation Rate
β = intercept

1.3 Valuation History of Indian Rupee

Devaluation means officially lowering the value of currency in terms of foreign currencies. There could be many motives of the devaluation. It stimulates exports of commodities. It restricts import demand for goods and services. It helps in creating a favorable balance of payments. Almost all the countries of the world have devalued their currencies at one time or the other with a view to achieving certain economic objectives. During the great depression of 1930 devaluation was carried by most countries of the world for the correcting their over-valuation. Since 1951, despite government attempts to obtain a positive trade balance, India experienced severe balance of payments deficits. Inflation caused Indian prices to go sky high. When the exchange rate is fixed and a country experiences high inflation relative to other countries, that country's goods become more expensive and foreign goods become cheaper. Therefore, inflation tends to increase imports and decrease exports. Since 1950, Indian continuously faced trade deficits. Another reason, which played important role in the 1966 devaluation, was war with Pakistan. The US and other countries withdrew their aid, which further necessitated devaluation. To improve fiscal position, Government of India devalued Rupee by whopping 57% against Dollar in 1991; India still had a fixed exchange rate system, where the rupee was hooked to basket of currencies of major trading partner countries. At the end of 1990, the Government of India found itself in serious economic trouble. The government was close to financial default and its foreign exchange reserves had dried up to the point that India could barely finance three weeks of imports. In July of 1991 the Indian government devalued the rupee by 19.5%. The government also changed its trade policy from its highly restrictive form to a system which allowed exporters to import 30% of the value of their exports (CAA A. Jain).

1.4 GDP growth rate, Exchange rate, Interest rate and Inflation rate in India

Table 6.1 shows the data on GDP growth, Exchange rate, Interest rate and Inflation rate in India during the period from 1987 to 2014. It is observed from the table that the on an average annual growth rate of GDP in India was 7.4 percent during the study period with increase of 1.85 times. Whereas on an average exchange rate was 38.38 per $ with increase of 4.71 times during 1987 to 2014 it was very high than GDP growth rate during this period. During the study period on an average Interest rate was 13.36 percent and Inflation rate was 7.87 percent. It is found that Interest rate and Inflation rates are decreased in 2014 with compare to the initial year 1987. It is observed from the data that the highest compound growth rate recorded by Exchange rate i.e. 4 percent followed by GDP growth rate 1.82 percent and Interest rate and Inflation rate recorded -0.007 percent and -0.004 percent compound annual growth rate respectively during the study period. The Exchange rate grew during this study period with an average 1.78 percent annually whereas GDP grew by 0.12 percent, Interest rate and Inflation rate grew by -0.23 percent annually during the study period. So it is clear that the exchange rate grew so more than GDP growth during the study period.

The Minimum and the maximum exchange rates were 12.96 and 61.02 respectively. Because of this wide dispersion of the exchange rate, the standard deviation 13.03 of the exchange rate from the mean exchange rate 38.58 was very high. Such high dispersion of the data gives only weak correlation and regression coefficients. In the case of inflation the data were more scattered.

Table 1: GDP Growth Rate, Exchange Rate, Interest Rate and Rate of Inflation in India (1987 to 2014)

Year	GDP Growth Rate	Exchange Rate	Interest Rate	Inflation Rate
1987	4.0	12.96	16.5	8.8
1988	9.6	13.92	16.5	9.4
1989	5.9	16.23	16.5	3.3
1990	5.5	17.50	16.5	9.0
1991	1.1	22.74	17.9	13.9
1992	5.5	25.91	18.9	11.8
1993	4.8	30.49	16.3	6.4
1994	6.7	31.37	14.8	10.2
1995	7.6	32.42	15.5	10.2
1996	7.5	35.43	16.0	9.0
1997	4.0	36.31	13.8	7.2
1998	6.2	41.25	13.5	13.2
1999	8.8	43.05	12.5	4.7
2000	3.8	44.94	12.3	4.0
2001	4.8	47.18	12.1	3.7
2002	3.8	48.61	11.9	4.4
2003	7.9	46.58	11.5	3.8
2004	7.9	45.31	10.9	3.8
2005	9.3	44.10	10.8	4.2
2006	9.3	45.31	11.2	6.1
2007	9.8	41.34	13.0	6.4
2008	3.9	43.50	13.3	8.4
2009	8.5	48.40	12.2	10.9
2010	10.3	45.72	8.3	12.0
2011	6.5	46.67	10.2	8.9
2012	5.1	53.43	10.6	9.3
2013	6.9	58.59	10.3	10.9
2014	7.4	61.02	10.3	6.4
Average	6.51	38.58	13.36	7.87
CAGR	1.82	4	-0.007	-0.004
AAGR	0.126	1.780	-0.230	-0.230
Maximum	10.3	61.02	18.9	13.9
Minimum	1.1	12.96	8.3	3.3
Std. Deviation	2.28	13.03	2.74	3.15

***Source*:** World Bank Data.

The Minimum and the maximum rate of inflation were 3.3percent and 13.9 percent respectively. However, the mean was 7.87 percent and the standard deviation was only 3.15 percent, which is more consistent. The data on growth rate of GDP were consistent. The Minimum and the maximum growth rate of GDP was 1.1 percent and 10.03 percent respectively. Average growth rate of GDP from 1987 to 2014 was 6.51 percent while the standard deviation was only 2.28 percent. The Minimum and the

maximum rate of interest were 8.3 percent and 18.9 percent respectively. However, the mean was 13.36 percent and the standard deviation was only 2.74 percent, which is also more consistent. According to standard deviation it is observed that the GDP growth is more consistent than exchange rate, interest rate and inflation rate during the study period in India.

1.5 Correlation analysis

Table 2: Correlation between GDP growth, Exchange rate, Interest rate and rate of inflation

		GDP Growth Rate	Exchange Rate	Interest Rate	Inflation Rate
GDP Growth Rate	Correlation	1	0.169	0.139	0.278
	Sig.(2-tailed)		0.389	0.478	0.153
	N	28	28	28	28
Exchange Rate	Correlation	0.169	1	-0.301	-0.324
	Sig.(2-tailed)	0.389		0.109	0.093
	N	28	28	28	28
Interest Rate	Correlation	0.139	-0.301	1	0.820
	Sig.(2-tailed)	0.478	0.109		9.047
	N	28	28	28	28
Rate of Inflation	Correlation	0.278	-0.324	0.820	1
	Sig.(2-tailed)	0.153	0.093	9.047	
	N	28	28	28	28

Pearson coefficient of correlation between the exchange rate and the growth rate of GDP is 0.230 (23 percent) with a significance level of 0.239 or 23.9 percent. The coefficient of correlation 0.230 indicates that the correlation between exchange rate and GDP growth is positive but not significant. But the interest rate and inflation rate have inverse effect on economic growth of India during the study period. The correlation between interest rate and inflation is -2.557 and -0.10 respectively. This implies that the higher the interest rate and inflation rate the lower the level of gross domestic product of India.

1.6 Regression Analysis

Table 3: Regression Result

Variable	Co-efficient	t-value	p
Constant	19.085	3.093	0.005
Exchange Rate	-0.087	-1.389	0.177
Interest Rate	-0.707	-2.327	0.029
Inflation Rate	0.029	0.212	0.834
R^2	0.230		
Adj.R^2	0.133		
F- Value	2.386		

The results of OLS show that Exchange Rate has negative relation with the GDP growth of India. One percent increase in Exchange Rate will decrease GDP by 0.087 percent. Interest rate has also negative relation with the GDP of India. It shows that one percent increase in Interest rate will decrease GDP by 0.70 percent. It found that exchange rate and interest rate has negative impact on economic growth of India during the study period. But the inflation rate has positive impact of economic growth of India but not significant. The inflation rate shows that one percent increase in inflation rate will 0.029 percent raise in economic growth of India. The value of R2 (coefficient of determination) in our model represents that 23 percent of the variations in the dependent variable (ln GDP) is due to independent variables included in the model.

1.7 Conclusion and Recommendations

This research study examined the impact of exchange rate on economic growth from 1987 to 2014. The result revealed that exchange rate has negative impact but not significant with (β =0.087, t = 1.389, Pns) this is not affirms previous studies that developing countries are relatively better off in the choice of flexible exchange rate regimes. The result also indicated that interest rate has negative impact on economic growth with (β = - 0.707, t = - 2.327, Pns). The regression result indicated that the inflation rate has positive impact but not significant with (β = 0.029, t = 0.2012, Pns) on economic growth of India. From the empirical reviewed work, some authors argued that exchange rate is positively related to economic growth, while some authors argued that it is negatively related. However, from empirical analysis of the study, it was found that exchange rate is negatively related to output growth. Therefore, this paper recommended that government should change the strategies in order to maintain sustainable interest rates in the country. It is also necessary to the government to take appropriate measures to control exchange rates through effective fiscal and monetary policy.

2. References

1. Alquist R, Chinn M. Conventional and Unconventional Approaches to Exchange Rate Modelling and Assessment, International Journal of Finance and Economics, Forthcoming. 2008.
2. Arize AC, Osang T, Slottje DJ. Exchange-Rate Volatility and Foreign Trade: Evidence from Thirteen LDCs. Journal of Business and Economic Statistics. 2000; 18(1):10-17.
3. Adeniran JO, Yusuf SA, Olatoke A. The Impact of Exchange Rate Fluctuation on the Nigerian Economic Growth: An Empirical Investigation, International Journal of Academic Research in Business and Social Sciences. 2014, 4(8).
4. Barkoulas JT, Baum C, Caglayan M. Exchange Rate Effect on the Volume and Variability of Trade Flows,

Journal on International Money and Finance. 2002; 21:481-406.
5. Bazlul Khondker H, Sayema Bidisha H, Mohammad Razzaque A. The Exchange Rate and Economic Growth: An Empirical Assessment on Bangladesh, International Growth Centre, Working Paper. 2012.
6. Basirat, Nasirpour, Jorjorzadeh. the effect of exchange rate fluctuations on economic growth considering the level of development of financial markets in selected developing countries over the period. 1986-2010.
7. CAA A. Jain, Currency Devaluation Hammers India.
8. Dornbusch R. Expectations and Exchange Rate Dynamics. Journal of Political Economy. 1976, 84:1161-76.
9. Dornbusch R. Exchange Rate Economics: Where Do We Stand? Brookings Papers on Economic Activity. 1980; 1:143-85.
10. Frenkel JA, Johnson HA. (eds.) The Economics of Exchange Rates: Selected Studies, Addison-Wesley. 1978.
11. Frenkel JA. A Monetary Approach to the Exchange Rate: Doctrinal Aspects and Empirical Evidence," Scandinavian Journal of Economics, 78, Proceedings of a Conference on Flexible Exchange Rates and Stabilization Policy. 1976, 200-224.
12. Goyal Ashima. Evolution of India's exchange rate regime, Indira Gandhi Institute of Development Research, Mumbai. 2010.
13. Jayachandran. Impact of Exchange rate on Trade and GDP for India a Study of Last four decade, International Journal of Marketing, Financial Services & Management Research. 2013, 9.
14. Khondker, Bidisha, Razzaque. The Exchange Rate and Economic Growth: An Empirical Assessment on Bangladesh, Working Paper, International Growth Centre. 2012.
15. Khandare VB, Babar SN. Structure of Foreign Direct Investment in India during globalization period, Indian Stream Research Journal. 2012, 2(3).
16. Marshall A. Money, Credit and Commerce, Macmillan, Molodtsova T. & D. H. Papell (2007), "Out-of-Sample Exchange Rate Predictability with Taylor Rule Fundamentals, University of Houston, manuscript. 1923.
17. Mussa M. The Exchange Rate, The Balance of Payments and Monetary and Fiscal Policy Under a Regime of Controlled Floating, Scandinavian Journal of Economics. 1976; 78:229-48.
18. Mussa M. Empirical Regularities in the Behaviour of Exchange Rates and Theories of the Forward Exchange Market, Carnegie-Rochester Conference Series on Public Policy. 1979; 11:9-57.
19. Martin Rapetti, Peter Skott, Arslan Razmi. Real Exchange Rate and Economic Growth: Are Developing Countries Different?, Working Paper 2011-07, University of Massachusetts Amherst. 2011.
20. Mehdi Basirat, Arezoo Nasirpour, Alireza Jorjorzadeh. The Effect of Exchange Rate Fluctuations on Economic Growth Considering the Level of Development of Financial Markets in Selected Developing Countries, Asian Economic and Financial Review. 2014; 4(4):517-528.
21. Ogun O. Real Exchange Rate Behaviour and Non-oil export Growth in Nigeria. African Journal of Economic Policy. 2006, 11(1).
22. Pami Dua, Rajiv Ranjan. Exchange Rate Policy and Modelling in India, Department of Economic Analysis and Policy, Reserve Bank of India, Study. 33.
23. Prakash, Rekha Sharma. Input Output Modeling of Impact of Exchange Rate Fluctuations on Indian Economy.
24. Saleh Mohammed, Shyamapada Biswas. Exchange Rate and Its Impacts On GDP and Inflation in Bangladesh, ASA University Review. 2009; 3(2)..
25. Stotsky, Ghazanchyan, Adedeji, Maehle. Relationship Between the Foreign Exchange Regime and Macroeconomic Performance in Eastern Africa, IMF Working Paper. 2012.
26. Servén L. Real-Exchange-Rate Uncertainty and Private Investment in LDCs. Review of Economics and Statistics. 2003; 85:212-18.
27. Vitek F. The Exchange Rate Forecasting Puzzle, manuscript, University of British Columbia. 2005.
28. Zita S, Gupta R. Modelling and Forecasting the Metical-Rand Exchange Rate, University of Pretoria Working Paper. 2007.
29. Khandare VB. Impact of Exchange rate on FDI: A Comparative Study of India and China, International Journal of Applied Research. 2016, 2(3).