

ANALYTICAL STUDY ON IMAPCAT OF MACRO ECONOMIC FACTORS ON EXCHANGE RATE OF INDIA

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Abstract: The exchange rate, which represents the price of one currency in terms of another, plays a pivotal role in the global market's open economies. It exerts a substantial influence on the overall economic performance and growth of a nation. Consequently, the correlation between the exchange rate and the macroeconomic factors associated with its fluctuations holds significant importance for any open economy. Exchange rates are among the most critical factors influencing a country's economic growth, directly impacting international trade. This study delves into the repercussions of various macroeconomic variables, including the Current Account Deficit (CAD), imports, exports, and Purchasing Power Parity (PPP), on the volatility of the US Dollar to Indian Rupee (USD to INR) exchange rate in India. The research aims to explore the long and short-term relationships between these variables and exchange rates. Various statistical tests, such as the Augmented Dickey-Fuller (ADF) test, stationary testing, stability testing, Johansen co-integration test, and Granger causality test, have been applied to decipher how these variables affect the exchange rate. Additionally, the study employs the ARIMA (Auto Regressive Integrated Moving Average) method for forecasting the future movements of exchange rates over a specific time horizon. Notably, when the country's CAD is effectively managed, it has an automatic control mechanism on the exchange rate, mitigating its impact on other economic variables. In today's globalized landscape, a nation's exchange rate assumes a paramount role, reflecting the stability and robustness of its economy. While exchange rates are primarily determined by the supply and demand for a nation's currency in the international market, various macroeconomic factors have been identified to exert influence, particularly in developing countries like India. A comprehensive comprehension of these factors serves as an authentic indicator of exchange rate movements. This study seeks to ascertain the impact of several macroeconomic variables, such as fluctuations in crude oil prices, GDP, Consumer Price Index (CPI), major capital market indices like BSE Sensex, and gold prices, on the exchange rate of the Indian currency.

Key Words: Exchange Rate, International Market, Macro-economic Factors, Indian Currency, GDP, FDI, Indian Rupee, US Dollar, Macro-economic, Post-globalization

Introduction:

Numerous economic factors exert influence on exchange rates. This research endeavors to scrutinize the causes and repercussions of the recent depreciation of the Indian Rupee against the US Dollar. Specifically, it seeks to dissect the intricate relationship between several macroeconomic factors and their impact on the Rupee-Dollar exchange rate. The variables under examination encompass Foreign Direct Investment (FDI), Gross Domestic Product (GDP), inflation, the percentage of money supply relative to GDP, and the rate of export growth. To explore these interconnections, a correlation analysis is employed. The study encompasses the period from 2013 to 2022, focusing on the dynamics of these macroeconomic variables.

According to the fundamental principles of economics, if the demand for the US Dollar in India surpasses its supply, its value appreciates while that of the Indian Rupee depreciates. This situation may arise due to the predominant need for dollars by importers to settle their obligations. It's conceivable that Foreign Institutional Investors (FIIs) are redirecting their investments away from India, resulting in a deficiency of US Dollars within the country. This predicament can only be rectified by bolstering exports, which infuse dollars into the economy. Encouragingly, the return of FIIs could partially address this imbalance. To achieve stability in exchange rates, India necessitates substantial structural and economic policy reforms.

Review of literature:

Mirchandani (2013): This study aims to pinpoint the underlying causes behind the depreciation of the Indian Rupee and investigates various macroeconomic determinants that influence exchange rate volatility and their degree of correlation with this phenomenon. It endeavors to identify potential reasons, such as reduced capital inflows and the prevailing uncertainty surrounding the Indian economy.

Bhandari (2014): This paper delves into the reasons for and consequences of the Rupee's depreciation against the US Dollar, specifically within the recent timeframe when, on August 28th, 2013, the Rupee reached a concerning rate of 68.80 against the Dollar, raising apprehensions about the Indian economy potentially reverting to a scenario reminiscent of 1991.

Edwards (2000): Edwards' research explores the dynamic connections between exchange rate regimes, capital flows, and currency crises in emerging economies. Drawing from the lessons learned during the 1990s, it addresses key policy debates that arose following crises in Mexico, East Asia, Russia, and Brazil. The conclusion emphasizes that, when certain conditions and policies align, floating exchange rates can be both effective and efficient.

Taylor (2001): Taylor discusses the shortcomings of liberalized policies in Argentina, particularly regarding capital flows and currency stability. He highlights Argentina's struggle in maintaining a liberalized approach, which involved pegging the exchange rate in the early 1990s,

linking domestic money supply and credit to international reserves. This system resulted in a substantial increase in domestic prices whenever there were significant capital inflows.

Harberger (2003): Harberger's study investigates the impact of economic growth on the real exchange rate. The findings indicate an absence of a consistent relationship between economic growth and the real exchange rate.

Husain et al. (2004): In their research, Husain and colleagues explore the availability of international capital for less developed countries, noting that they typically have limited access to such resources. They observe a connection between a fixed exchange rate regime and low inflation rates, as well as a higher level of durability in these nations. However, their study fails to identify a strong and consistent link between economic performance and exchange rate regimes in developing economies. They also find that advanced economies may experience sustained and moderately higher growth rates without a corresponding increase in inflation under a flexible exchange rate regime.

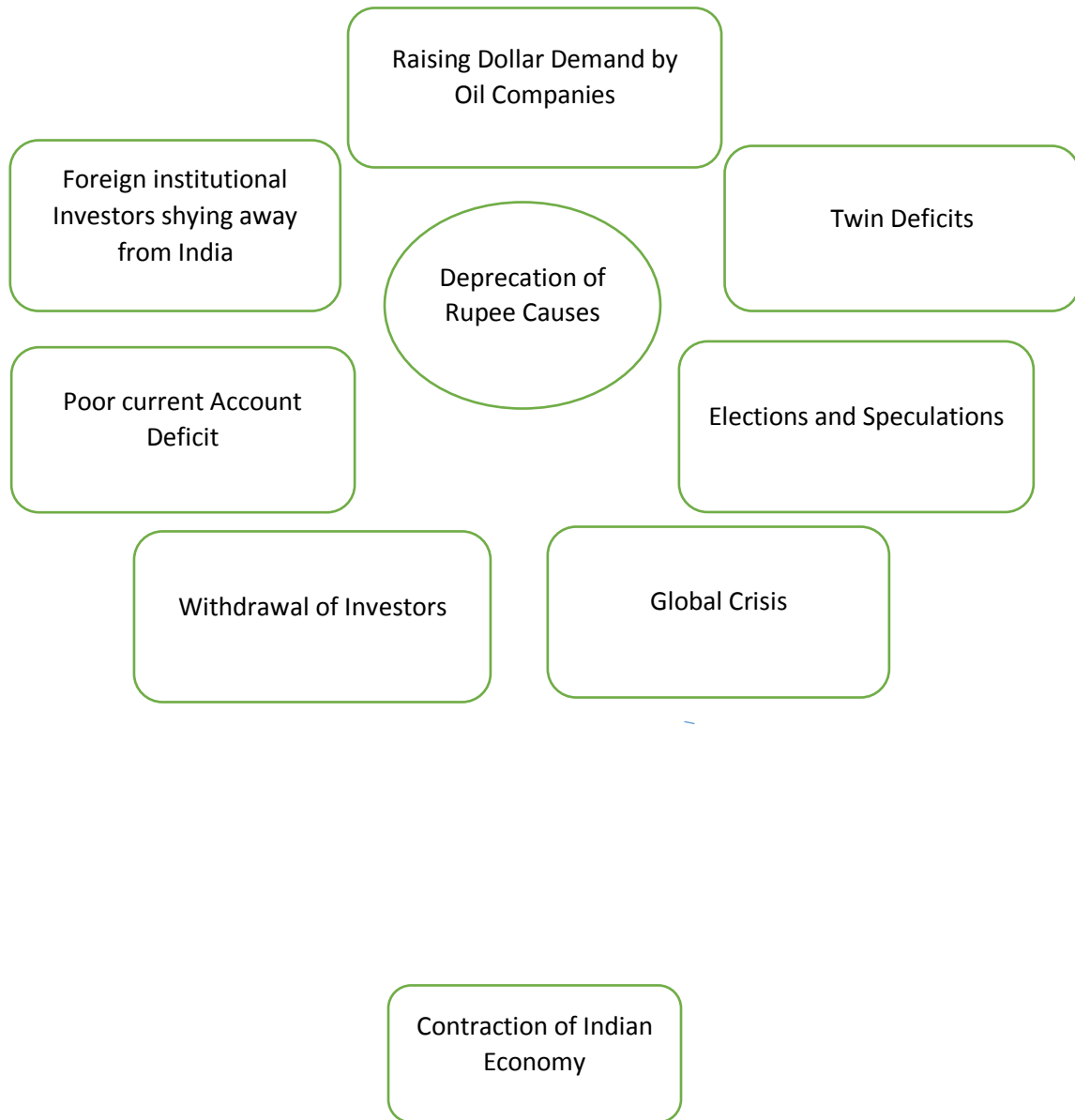
Objectives of the study:

- To know the reason of depreciation of rupee & its impact on Indian economy.
- To analyze the correlation between inflation & exchange rate
- To analyze the correlation between GDP & exchange rate

Research Methodology: This study employs a descriptive research methodology, relying on secondary data as its primary source of information. It examines various economic factors, including GDP, inflation, money supply, and export growth, to assess their potential influence on exchange rates. The analytical approach involves utilizing statistical correlation techniques to gauge the extent of impact. Furthermore, a forecast for the average exchange rate in the year 2014 has been computed through forecasting techniques.

Causes of Depreciation of rupee

There is a growing concern that the Rupee's depreciation is reminiscent of the situation in 1991. The historical journey of the Indian Rupee (INR) against the US Dollar (USD) dates back to the pre-Independence era when the INR was at par with the USD. Post-Independence, India initially adopted a fixed-rate currency system with the Rupee pegged to the British Pound (GBP). However, as circumstances evolved over time, these pegs underwent adjustments. Over the span of 66 years since Independence, the INR has depreciated 66 times against the USD, as of the end of August 2013. Notably, in the last five years, the Rupee has experienced a significant 60% depreciation. Several factors have contributed to this depreciation.



Escalating Demand for US Dollars by Oil Companies: The price of crude oil has posed a significant challenge for India as it relies heavily on imports to meet its energy needs. With the yearly surge in oil consumption within India, the situation has exacerbated. Globally, oil prices are denominated in US dollars. Consequently, as India's demand for oil rises or global oil prices increase, the necessity for additional US dollars to settle supplier invoices also grows. This scenario contributes to a substantial depreciation of the Indian Rupee (INR) in relation to the US Dollar. Notably, oil companies require nearly Rs. 400 million daily.

Foreign Institutional Investors (FIIs) are selling more than they are buying, leading to a decrease in net FII inflow from Rs. 43,533.06 million in 2012 to Rs. 538.35 million in 2013.

The critical factor behind the Indian government's inability to halt the depreciation of the national currency is the substantial current account deficit. In the 2012-13 fiscal year, India's current account deficit measured at 4.8% of the GDP. The government has struggled to identify new export destinations for its products, hindering growth in this sector. Challenges also arise from the lack of a streamlined clearance process and procedural delays. Even traditionally successful areas in this regard have faced setbacks.

Recent decisions by ArcelorMittal and Posco to withdraw from their projects in India have had a negative impact. Posco abandoned a Rs. 30,000 crore steel plant project in Karnataka, while ArcelorMittal pulled out of a Rs. 52,000 crore steel plant project in Odisha. Delays and land acquisition problems were major contributors. Despite the relaxation of FDI regulations in multi-brand retail, only Tesco has committed to investing in India.

Key sectors of the Indian economy, including manufacturing, mining, and agriculture, have exhibited sluggish growth in 2013, making them less attractive to investors. Industrial production in India declined by 2.2% in June 2013, and the RBI forecasted a fiscal year growth of 5.5% in July 2013, lower than its previous estimate of 5.7%.

Given its status as a developing economy with high inflation, a certain degree of currency depreciation is natural for India. However, the recent abrupt depreciation has had adverse effects on the economy. The Indian Rupee has been consistently depreciating since the beginning of 2013, exacerbated by the heightened volatility in the global economy. Factors such as the Eurozone crisis and the US credit downgrade have prompted capital flight to boost the US domestic economy, resulting in a shortage of US dollars. This has created challenges for India, which needs to attract substantial foreign investment to bridge its fiscal and current account deficits. Simultaneously, a global debt crisis coincided with the weakening of the Indian economy, compounding exchange rate issues. The appreciation of the US dollar has contributed to the devaluation of the Indian Rupee, with the US Federal Reserve's announcement of quantitative easing being a key factor.⁷ One of the theories doing the rounds is that the currency typically depreciates in periods earlier to general elections. In fact, data from 1984, too, shows that the rupee has tended to weaken in periods preceding elections. Secondly, the rupee's decline can be largely attributed to prevailing market speculations. A sharp rise in dollar rates prompted

importers to rush for dollars to hedge their positions, increasing the demand for dollars. Simultaneously, exporters held onto their dollar reserves, anticipating a further rupee depreciation in the future. This tug-of-war between these two forces further heightened the demand for dollars while limiting their supply in the market, consequently causing the rupee's decline.

Running deficits should only be considered viable if they can generate future returns; otherwise, they reach unsustainable levels, impede the development process, and exert downward pressure on economic growth while driving up inflation. This scenario creates a state of stagflation. An escalation in fiscal deficits results in increased government borrowing, which displaces the private sector and hampers investments in the economy. This weakens economic growth, exacerbates deficits, and perpetuates a detrimental cycle.

Impact of depreciation of rupee:

- Rupee depreciation will boost earnings for exporters but escalate costs for importers.
- The trade deficit will expand due to more expensive imports, exacerbating the current account deficit.
- Spending on foreign exchange-denominated transactions will increase.
- Capital inflow will decelerate or reverse.
- Expenditure on discretionary goods will rise.
- Forex reserves may decrease, adding pressure on the rupee.
- In times of weak demand, companies might struggle to pass on increased input costs.
- The government and the RBI have recently implemented a series of measures to reduce the current account deficit and strengthen the rupee, including raising import duties on gold.
- Exporters are unable to exploit the depreciating rupee swiftly enough due to fixed-price contracts in rupees, which prevent them from reaping the benefits of its rapid devaluation. The balance of payments is tilting significantly against us.
- The Indian stock market will experience substantial volatility.
- Global rating agencies may downgrade India's rating to "Junk" status, making international borrowing more challenging and costly.

Data Interpretation & Analysis:

Table showing GDP, Inflation, Lending Interest Rates, FDI, Government Debt in % of GDP, & exchange rate from the period 2010-2022

Year	GDP	Inflation	Lending Interest Rates	FDI	Government Debt in %of GDP	Exchange Rate
2010	10.30%	10.50%	12.30%	2740.00%	66.40%	47.4166
2011	6.60%	9.50%	13.70%	36.5	68.60%	45.5768
2012	5.50%	y10.00%	14.50%	24	68.00%	47.9229
2013	6.40%	9.40%	14.80%	28.15	67.70%	53.2112
2014	7.40%	5.80%	14.20%	34.58	67.10%	60.5019
2015	8.00%	4.90%	14.30%	44.01	69.00%	61.1436
2016	8.30%	4.50%	14.00%	44.46	68.90%	65.4685
2017	6.80%	3.60%	13.80%	39.97	69.70%	67.072
2018	6.50%	3.40%	13.60%	42.12	70.40%	64.4549
2019	3.70%	4.80%	13.45%	50.61	75.10%	69.9229
2020	-6.60%	6.20%	12.30%	64.36	89.20%	74.5321
2021	8.70%	5.50%	12.20%	71.73	84.20%	73.2256
2022	6.80%	6.90%	13.45%	84.8	83.40%	78.6048

Table 1: Correalion Results on the above variables:

Sr.no	Variable X	Variable Y	
1	GDP	Exchange Rate	-0.36
2	Inflation	Exchange Rate	-0.71
3	FDI	Exchange Rate	0.87
4	Lending interest rate	Exchange Rate	-0.37
5	Government DEBT	Exchange Rate	0.78

Table 2 Table showing GDP,

year	2021	2022	2023(Forecasts as per RBI)
GDP	8.70%	6.80%	6.00%
Exchange Rate	73.2256	78.6048	82

FORECAST(x,known_y's, known_x's)

X, is the forecast GDP for the year 2023 Known, y's is the value of exchange rate for year 2021 & 2022 Known x's is GDP for the year 2021 & 2022. The equation for FORECAST is $a+bx$,

Where

$$a = y - bx$$

and:

$$b = \frac{\sum(x-x)(v-y)}{\sum(x-x)^2}$$

$$\sum(x-x)^2$$

Interpretation:

It is evident that there is a negative correlation between GDP and the exchange rate, indicating that as GDP rises, the rupee appreciates, while as GDP declines, the rupee depreciates against the dollar.

A negative correlation is observed between Inflation and the exchange rate, implying that as inflation increases, the rupee appreciates, whereas as inflation decreases, the rupee depreciates against the dollar.

A positive relationship exists between FDI and the exchange rate, signifying that as FDI increases, the rupee depreciates, while as FDI decreases, the rupee appreciates.

There is a negative correlation between Interest Rate and the exchange rate, meaning that as interest rates increase, the rupee appreciates, whereas as interest rates decrease, the rupee depreciates.

A positive relationship is noted between Government Debt and the exchange rate, indicating that as Government Debt increases, the rupee depreciates, whereas as Government Debt decreases, the rupee appreciates.

Conclusion:

The depreciation of the rupee has had widespread repercussions across the entire economy, affecting every individual, including the common man. Our analysis has revealed a positive correlation between the rupee and both GDP and export growth. Therefore, it is imperative that we prioritize efforts to enhance exports by rectifying the underlying economic fundamentals. Immediate economic reforms must be implemented to instill confidence in foreign investors. A stable currency regime, crucial for sustained economic growth, can only be achieved by addressing structural issues that bolster productivity and maintain a stable inflation environment. This, in turn, leads to a more stable fiscal deficit and external sector. By focusing on these aspects, India can embark on a path of sustainable growth characterized by stability in fiscal deficit, current account deficit, inflation, and overall economic expansion.

References:

Pal, K., & Mittal, R. (2011). Impact of macroeconomic indicators on Indian capital markets. *The journal of risk finance*, 12(2), 84-97.

Pramod Kumar, N. A. I. K., & Puja, P. (2012). The impact of macroeconomic fundamentals on stock prices revisited: An evidence from Indian data.

- Gurloveleen, K., & Bhatia, B. S. (2015). An impact of macroeconomic variables on the functioning of Indian stock market: A study of manufacturing firms of BSE 500. *Journal of Stock & Forex Trading*, 5(1), 1-7.
- Nisha, N. (2015). Impact of macroeconomic variables on stock returns: evidence from Bombay Stock Exchange (BSE). *Journal of Investment and Management*, 4(5), 162-170.
- Gay Jr, R. D. (2008). Effect of macroeconomic variables on stock market returns for four emerging economies: Brazil, Russia, India, and China. *International Business & Economics Research Journal (IBER)*, 7(3).
- Jain, A., & Biswal, P. C. (2016). Dynamic linkages among oil price, gold price, exchange rate, and stock market in India. *Resources Policy*, 49, 179-185.
- Kaur, K. (2014). An Empirical Study of Inflation, Unemployment, Exchange Rate and Growth in India. *Asian Journal of Multidisciplinary Studies*, 2(10), 19-21.
- Ratanapakorn, O., & Sharma, S. C. (2007). Dynamic analysis between the US stock returns and the macroeconomic variables. *Applied Financial Economics*, 17(5), 369-377.
- Athukorala, P. C., & Rajapatirana, S. (2003). Capital inflows and the real exchange rate: a comparative study of Asia and Latin America. *World Economy*, 26(4), 613-637.
- Pethe, A., & Karnik, A. (2000). Do Indian stock markets matter? Stock market indices and macro-economic variables. *Economic and political weekly*, 349-356.
- Ratanapakorn, O., & Sharma, S. C. (2007). Dynamic analysis between the US stock returns and the macroeconomic variables. *Applied Financial Economics*, 17(5), 369-377.
- Ghosh, S. (2011). Examining crude oil price–Exchange rate nexus for India during the period of extreme oil price volatility. *Applied Energy*, 88(5), 1886-1889.
- Huy, D. T. N., Dat, P. M., & Anh, P. T. (2020). BUILDING AN ECONOMETRIC MODEL OF SELECTED FACTORS'IMPACT ON STOCK PRICE: A CASE STUDY. *Journal of Security & Sustainability Issues*, 9.
- Duanmu, J. L., & Guney, Y. (2009). A panel data analysis of locational determinants of Chinese and Indian outward foreign direct investment. *Journal of Asia business studies*, 3(2), 1-15.
- Sinha, D. A. K., Sahoo, S. K., & Pattanaik, D. (2015). A study of relationship between exchange rate volatility and banking indices (BANEX)–An Indian Perspective. *Srusti Management Review*, 8.
- Hari, K. S., & Kannan, K. P. (2002). Kerala's gulf connection emigration, remittances and their macroeconomic impact 1972-2000. Dripsakis, N. (2004). Tourism as a long-run economic growth factor: an empirical investigation for Greece using causality analysis. *Tourism economics*, 10(3), 305-316.