

Significant Impact of Macro Economic Variables on Currency Exchange Rate: A Design Thinking Approach

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Abstract

In the nation's foreign trade, the exchange rate is crucial. The exchange rate is a key macroeconomic indicator of a country's economic standing globally and is a measure for assessing its level of international competitiveness. The country's foreign exchange system is intimately tied to its development. The present study aimed to understand the significant impact of selected macro-economic variables on currency exchange rate between USD and INR. Current Account Balance, FDI Inflows, Interest Rate, Inflation Rate, GDP and Prime Lending Rate are considered as the macro-economic variables for this study. Data ranging from 2000-01 to 2020-21 are collected from the official websites and analysed using proper statistical tools like descriptive statistics, correlation coefficient and multiple regression analysis. The study found the significant influence of four variables namely, inflation rate, interest rate, FDI inflows and interest rate on the currency exchange rate between USD and INR.

Keywords: Design Thinking, Exchange Rate, Macro Economic Variables, Currency, Foreign Direct Investment, Gross Domestic Product, Indian Rupee, US Dollar

INTRODUCTION

Like the price of any other goods or services, the value of a currency depends on supply and demand in the world market. A currency's value will decrease as its supply rises. The opposite is accurate when there is a rise in currency demand. A number of variables that are present at any given time have an impact on the currency price of an economy. Interest rates, global commerce, inflation, political stability and other similar factors are some of the most significant influences on currency prices. The volatility of currency exchange rates is typically four times that of interest rates and ten times that of inflation, according to (Sahoo, 2012). The complexity of making investment and international business decisions would increase with exchange rate volatility, which suggests a higher exchange rate risk. Therefore, it is crucial for participants in the global market to be aware of these risks and choose between the two available options, namely investing in the domestic market and earning a specific return or investing in

the global market with a higher level of uncertainty where they can lower their risk through a variety of available hedging mechanisms.

RUPEE VALUATION

When the value of the Indian rupee declines in comparison to other currencies, such as the US dollar, the euro, or the Japanese yen, this is known as rupee depreciation. Depreciation can happen for a number of reasons, including increased inflation, trade deficits, geopolitical unpredictability, or shifts in the state of the world economy. When the rupee depreciates, it indicates that it has lost some of its purchasing power against other currencies and that more rupees are needed to purchase the same amount of foreign cash. For instance, if a dollar could previously be purchased for Rs.80, depreciation may have increased the price to Rs.90.

When the value of the Indian rupee (INR) rises in comparison to other currencies, such as the US dollar, the euro, or the Japanese yen, this is referred to as rupee appreciation. Different things, such decreased inflation, more foreign investment, political stability, or advancements in the home economy, can cause appreciation. When the value of the rupee increases relative to other currencies, it means that fewer rupees are needed to purchase the same amount of foreign cash. For instance, if a dollar could previously be purchased for ₹80, appreciation may have increased the price to ₹70.

This is significant because we must first purchase dollars before importing things. As a result, if dollars become expensive, imports must also be expensive.

REASONS FOR CURRENCY FLUCTUATION

Numerous factors, including macroeconomic conditions, political developments, market sentiment, trade balance, capital flows, and currency speculation, cause currency movements. These elements may alter a country's currency supply and demand in the foreign exchange market, changing the currency's value. However, depending on the situation, currency swings can have both beneficial and negative consequences on the economy. For instance, a stronger currency may result in lower import prices but less competitive exports, whereas a weaker currency may result in improved export competitiveness but higher inflation and lower consumer purchasing power. When analysing currency swings, it is crucial to take these factors and their impacts into account. The Indian rupee's value relative to other currencies can fluctuate due to a number of variables, including:

- **Inflation:** The value of the rupee may fall in comparison to other currencies if India's inflation rate is higher than that of other nations.
- **Trade Balance:** The demand for foreign currency rises when India has a trade deficit, meaning that it imports more than it exports, which lowers the value of the rupee.
- **Foreign Investment:** Increased foreign investment in India raises demand for the rupee, which causes the rupee's value to rise.
- **Political Stability:** The value of the rupee may fall if there is political unrest or uncertainty in India because investors may lose faith in the nation's economy.
- **Global Economic Conditions:** The value of the rupee can be impacted by changes in the world economy, including those in interest rates, the cost of commodities like oil, and the value of the US dollar.

- **Capital Flows:** Significant capital inflows or outflows can have an impact on the value of the rupee. For example, if foreign investors withdraw their funds from India, it might lead to a decline in the value of the rupee.
 - **Reserve Bank of India (RBI) Actions:** The value of the rupee may also be impacted by actions taken by the RBI, such as adjusting interest rates or intervening in the foreign currency market.
- These variables are intricate, and they can have a variety of interconnected effects on the rupee. As a result, managing and predicting the rupee's value in relation to other currencies can be difficult.

DESIGN THINKING METHODOLOGY

A Design Thinking approach is followed in this study to assess the significant impact of macro-economic variables in Indian currency rates with respect to USD. Design Thinking is a problem-solving approach that places the user or customer's needs and experiences at the center of the process, (Prabakaran & Krishnaveni, 2020). This methodology is used to develop innovative solutions for complex problems. The Design Thinking methodology is a collaborative and iterative process that aims to create desirable, feasible, and viable solutions, (Archana, et al., 12).

The Design Thinking process involves five stages: Empathize, Define, Ideate, Prototype, and Test. Firstly, the team gathers insights into the user or customer's needs and experiences in the empathize stage. Secondly, the problem is defined based on the insights gained in the previous stage. Thirdly, in the ideate stage, the team generates many potential solutions to solve the problem. Fourthly, the team creates a prototype of the potential solution in the prototype stage. Lastly, the team tests the prototype with users or customers to identify any issues and refine the solution, (Prabakaran, Krishnaveni, Swarnam, & Kumar, 2023).

EMPATHY

When it comes to Design Thinking, Empathy is the capacity to comprehend and share the emotions, ideas, and experiences of others, particularly those of the customers or end-users for whom the good or service is being created. Because it helps designers better understand the wants, concerns, and aspirations of their consumers, empathy is a crucial part of Design Thinking. Empathy in the context of design thinking entails paying attention to what people are saying, watching how they behave and engage with products or services, and having a conversation with them to learn more about their experiences. The goal of this research project is to compile the opinions of experts who have published studies on the impact of macroeconomic factors on Indian currency exchange rates, particularly between USD and INR.

(Ramasamy & Abar, 2015) studied the effects of linked macroeconomic variables on exchange rates using the annual exchange rates of three different nations. To raise the sample size needed to run a regression and analyse the effect, the study used the bootstrap approach. The findings demonstrate the strength of Model B, demonstrating that all of them with the exception of employment and budget deficits, macroeconomic changes have had a significant impact on the exchange rate. Numerous macroeconomic variables display contrary indications to expectations, leading researchers to believe that psychological factors like investor confidence in managing economic variables influence exchange rate volatility.

The goal of the research by (Khera & Singh, 2015) was to pinpoint the variables that influence wealth and have an impact on the value of the rupee, the national currency of India. The report also discusses

the exchange rate of the Indian rupee (INR) to the US dollar (USD) following globalisation and suggested controls for rupee devaluation. The five carefully chosen independent variables included in this study inflation rate, lending interest rate, foreign direct investment, gross domestic product growth rate, and current account deficit are all substantially correlated with exchange rate. Because there is a significant correlation between the dependent and independent variables, it is possible to increase the value of the rupee today by taking measures to reduce imports and encourage FDI in both developed and developing economies.

(Hasan & Islam, 2023) undertook a study to identify the significant macroeconomic factors influencing the exchange rate by using data for Bangladesh for 20 years, from 2002 to 2021. The data are analysed using multiple linear regression and Pearson's correlation. The findings show a considerable positive link between the exchange rate and the current account balance, foreign exchange reserve, remittances, and GDP growth rate. However, there is no statistically significant correlation between the interest rate and the current account balance and the exchange rate. Therefore, the elements that have the greatest impact on the exchange rate are the current account balance, foreign exchange reserve, remittances, and GDP growth rate.

(Akhter & Faruqui, 2015) analyzed and reviewed how economic reforms have affected the exchange rate, compared the effectiveness of past and present reform processes in a few South Asian countries, and looked into Bangladesh's experience with various reform processes. Four primary independent variables such as export amount, remittance, import amount, and foreign currency reserve as well as the exchange rate are considered in these analyses. The findings demonstrated that macroeconomic factors significantly affect the exchange rate. The study also found that Bangladesh's adoption of the floating reform system had a positive impact on the country's economic growth.

The relationship between the GDP, CPI, and interest rate and the exchange rate for industrialised and emerging nations was attempted to be explored (Fraz & Fatima, 2016). For this, three G7 nations such as Canada, the United Kingdom, and Japan as well as three emerging nations India, Brazil, and South Africa were chosen. The findings demonstrate that GDP growth, inflation, and interest rate have a significant impact on the exchange rate for both developed and developing countries using the OLS regression estimation and Granger causality test. The study also demonstrated the strong and considerable influence that all macroeconomic factors have on the exchange rate.

(Shafique A. , Hassan, Shahzad, Ali, & Saqlain, 2022) examined the association between exchange rate volatility and a few key macroeconomic indicators, including foreign direct investment, gross domestic product, and inflation. The methods utilised for evaluating hypotheses are regression analysis, GARCH, co-integration test, unit root test, and test of unity. Further research came to the conclusion that exchange rates exhibit long-term and persistent volatility, that they positively correlate with the GDP and foreign direct investments but negatively and insignificantly with inflation.

For an open economy in the global market, the price of one currency in relation to another (exchange rate) is a crucial factor since it influences the economy's overall performance and pace of expansion. Thus, for any open economy, the relationship between the exchange rate and the associated macroeconomic factors that cause variation in the former's value is quite significant, (Thacker, 2022). One of the key drivers of economic growth in any nation is the exchange rate, which directly affects global trade.

The research studies examined the effects of macroeconomic variables on the volatility of the exchange rate (USD to INR) in India, including the current account deficit, import, export, and purchasing power parity. The study has examined the relationships between these variables and the exchange rate over the long and short terms. To determine how the variables are affecting the exchange rate, the ADF test, Stationarity Testing, Stability Test, Johansen Co-integration Test, and Granger Causality Test have been applied. The ARIMA method of forecasting has been used to predict future movement of exchange rates for a specific period of years.

(Khan, Teng, & Khan, 2019) analysed the impact of macroeconomic factors on the USD/CYN exchange rate using annual time series data for the Chinese economy from 1980 to 2017. To examine if there is a long-term relationship between the dependent and independent variables, the ARDL limits test method for cointegration is used. According to the long-run ARDL findings, trade openness, GDP growth, and interest rates all have a positive impact on the USD/CNY exchange rate, whereas inflation and interest rates have a negative impact.

Both exports and imports benefit from the exchange rate, and an increase in the exchange rate does not necessarily mean that GDP will increase much. There will be a considerable boost in GDP as a result of the depreciation of the Rupee, which increases exports and decreases imports (Mayura, 2017). However, macroeconomists have yet to reach any firm conclusions about the long-term variables affecting the exchange rate (Parveen, Khan, & Ismail., 2012)

(Shafique A. , Hassan, Shahzad, Ali, & Saqlain, 2022) examines the association between exchange rate volatility and a few key macroeconomic indicators, including foreign direct investment, gross domestic product, and inflation. For the 29-year period (1991 to 2019) of Pakistan, secondary time-series data are used and gathered from global development indices. The methods utilised for evaluating hypotheses are regression analysis, GARCH, co-integration test, unit root test, and test of unity. The study's findings show that exchange rates exhibit long-term and persistent volatility, are positively correlated with the gross domestic product and foreign direct investments, but are negatively correlated with inflation.

DEFINE [PROBLEM STATEMENT]

Changes in the exchange rate between two currencies can have positive or negative effects on the health and expansion of an economy. Therefore, it becomes important to research the causes of such oscillations so that people and/or governments can make wise economic and financial choices in order to prevent too many variations that increase risk in global operations. Studying the connections between the exchange rate and the macroeconomic factors that influence its volatility can aid in the prevention of negative impacts.

Define is the second stage of Design Thinking process followed by Empathy stage in which review of literature were carried out. Form the detailed literature study, following potential questions are identified.

Table 1: Define

Design Thinking Stage	Identified Problem Statements
Define	• What are the variables to be considered for this study as macro-economic variables? • Does inflation rate / lending rate / FDI / Current Account balance / Export & Import / CPI / GDP create significant impact on currency exchange rate in India? • Does investors' confidence in managing economic variables influence exchange rate volatility? • Can a trader / speculator predict the exchange rate using the macro-economic variables and generate profit out of this? • What statistical tools to be used to assess the significant impact of macro-economic variables on exchange rates? • What is the idle period to be considered in which the external influence on currency exchange rate is less or zero?

The above research questions are the outcomes of Empathy stage which leads to define the objectives of the present study. The objectives of this present study is designed primarily intended to identify / assess the significant impact of selected macro-economic variables on currency exchange rates specific to INR to USD. Further, the direction and magnitude / degree of impact will also be assessed with suitable statistical tools.

Rationale of the study

Changes in the exchange rate between two currencies can have positive or negative effects on the health and expansion of an economy. Therefore, it becomes important to research the causes of such oscillations so that people and/or governments can make wise economic and financial choices in order to prevent too many variations that increase risk in global operations. Studying the connections between the exchange rate and the macroeconomic factors that influence its oscillations can aid in limiting the negative effects that occur.

Research Objectives

- To ascertain the exchange rate's dependence on the relevant macroeconomic components
- To research the dollar's (USD) movement in relation to the Indian rupee (INR) after globalisation
- To ascertain the variables influencing the value of the rupee and how they relate to the exchange rate.

IDEATE [RESEARCH METHODOLOGY]

The nature of research is Exploratory & Analytical that generates hypotheses by analyzing a data-set and looking for potential relations between variables. Secondary sources were referred for data collection for the analysis. The required data for the study were collected and compiled from the RBI and World Bank Website/Bulletin. The study covers a period of 21 years from 2000-2001 to 2020-21. There are several factors affecting the exchange rate like the inflation, interest rates, current account

balance, public debt, the terms of trade, economic and political factors, FDI, FII, etc. From these, five independent variables have been identified for the purpose of the study which are

- Inflation rate
- Lending interest rate
- Foreign Direct Investment
- Gross Domestic Product
- Current Account Balance

Further, below hypothesis is framed to test its significant impact of the above variables on currency exchange rate.

H1: Inflation rate has significantly influenced the exchange rate of Indian Rupee.

H2: Lending Interest rate has significantly influenced the exchange rate of Indian Rupee.

H3: FDI has significantly influenced the exchange rate of Indian Rupee.

H4: GDP Growth Rate has significantly influenced the exchange rate of Indian Rupee.

H5: Current Account balance has significantly influenced the exchange rate of Indian Rupee.

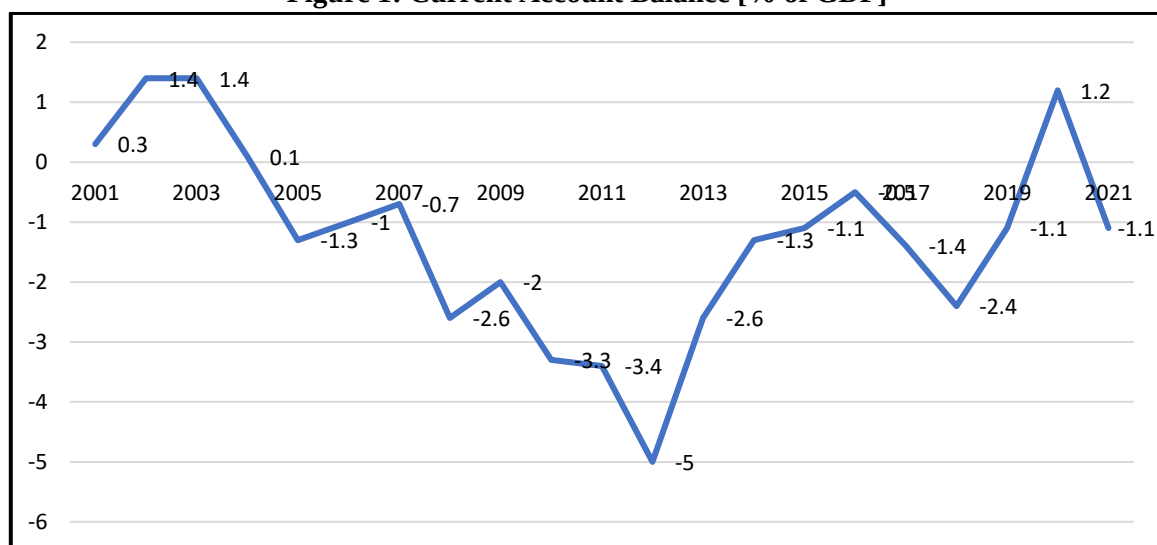
PROTOTYPE & TESTING STAGE [ANALYSIS AND INFERENCE]

Current Account Balance

A country's international trade and financial transactions with the rest of the world are gauged by its current account balance. It is made up of net investment income, net transfers, and the difference between a country's total exports and total imports of goods and services.

A positive current account balance indicates that a nation is earning more money from international commerce and financial transactions than it is spending because it is exporting more goods and services than it is importing. A country with a negative current account balance, on the other hand, is one that imports more than it exports and spends more on foreign commerce and financial activities than it does. The current account balance is a crucial marker of a nation's economic health and can have a big impact on interest rates, currency exchange rates, and overall economic expansion. Considering this, the historical data of Current Account balance in terms of percentage of GDP from 2000-01 to 2020-21 was collected form (The World Bank, 2023) and the pictorial representation of the data collected is presented in Figure 1, as given below.

Figure 1: Current Account Balance [% of GDP]



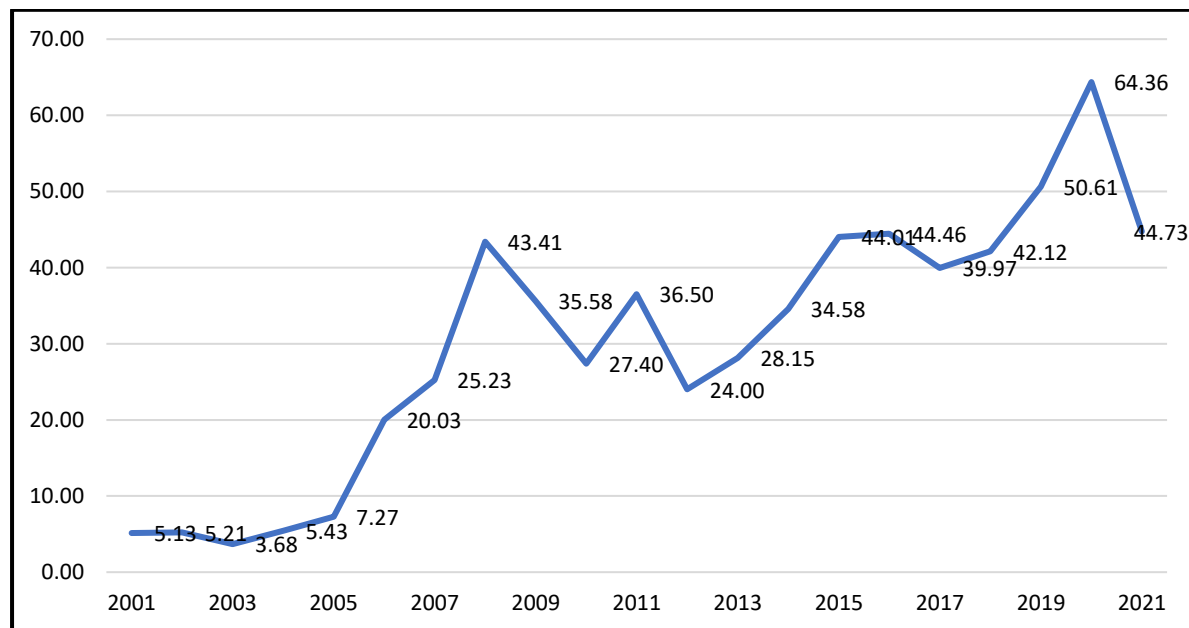
Foreign Direct Investment - Inflows

Foreigners investing in a nation's enterprises or assets are referred to as making FDI inflows, which stands for foreign direct investment. These investments are made with the intention of making money or receiving other benefits from the investment. They are made to obtain an ownership interest or a considerable amount of control over the invested assets.

FDI inflows are crucial for a nation's economic development and growth because they bring in money, knowledge, and resources that can enhance output, create jobs, and strengthen export capacities. FDI inflows can also help local supply chains grow, knowledge and skills are transferred, infrastructure is improved, and social services are improved.

A number of variables, including a nation's economic policies, political stability, legal and regulatory system, market size, and degree of development, all have an impact on the amount of FDI that enters that nation. FDI inflows are frequently calculated based on the sum of the investments and the number of projects or businesses engaged. The present study has collected FDI inflows from 2000-01 to 2020-21 and presented below.

Figure 2: FDI Inflows in USD Billion



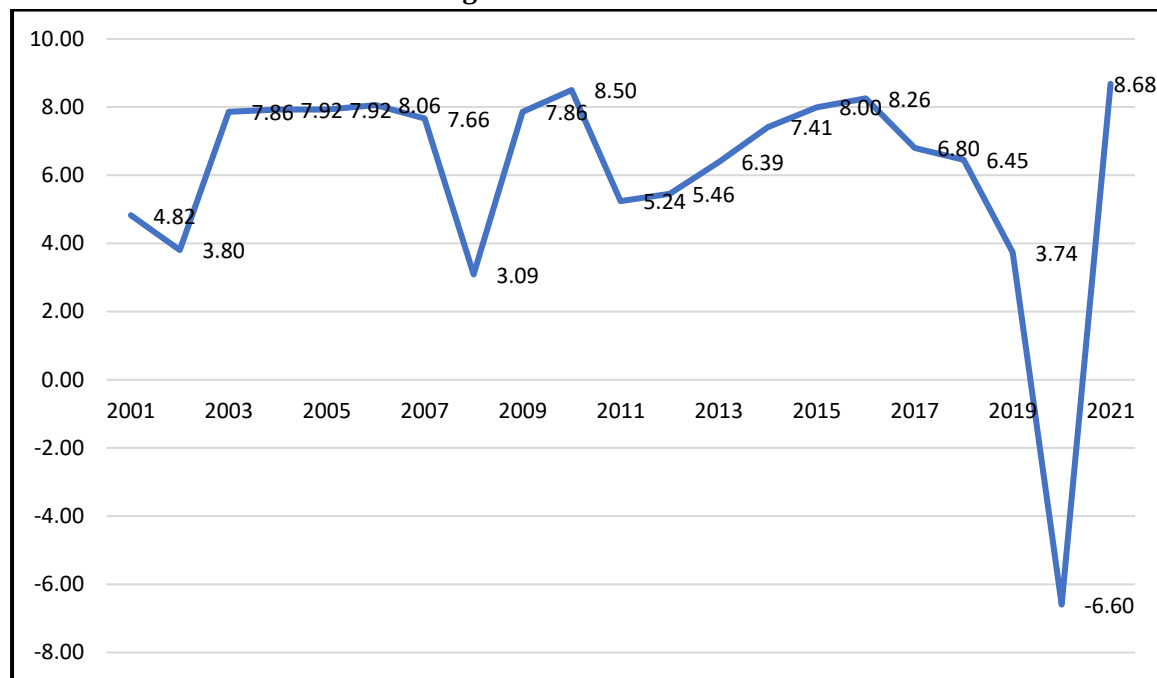
Gross Domestic Product

Gross Domestic Product, or GDP, is the sum of the financial values of all the goods and services produced inside a nation's borders over a given time period, usually a year. One of the most popular measures of a nation's economic performance is its GDP, which is frequently used to compare the economic output of various nations.

The production approach, the expenditure approach, and the income approach are the three methods that can be used to compute GDP. The value of all goods and services produced in the nation is added up when calculating GDP using the production technique, whereas the value of all goods and services purchased by consumers, businesses, and the government is added up when calculating GDP using the expenditure approach. The income technique adds up all of the income that the nation's citizens and businesses generate to determine GDP.

Although a country's GDP is a crucial indicator of its economic health, neither the welfare of its population nor the distribution of income within the nation are necessarily reflected in it. For a better understanding of a nation's total economic and social well-being, other measures like income inequality, poverty rates, and access to healthcare and education are also crucial. The GDP growth rate of the country from 2000-01 to 2020-21 was collected and presented as a line chart as given below.

Figure 3: GDP Growth Rate



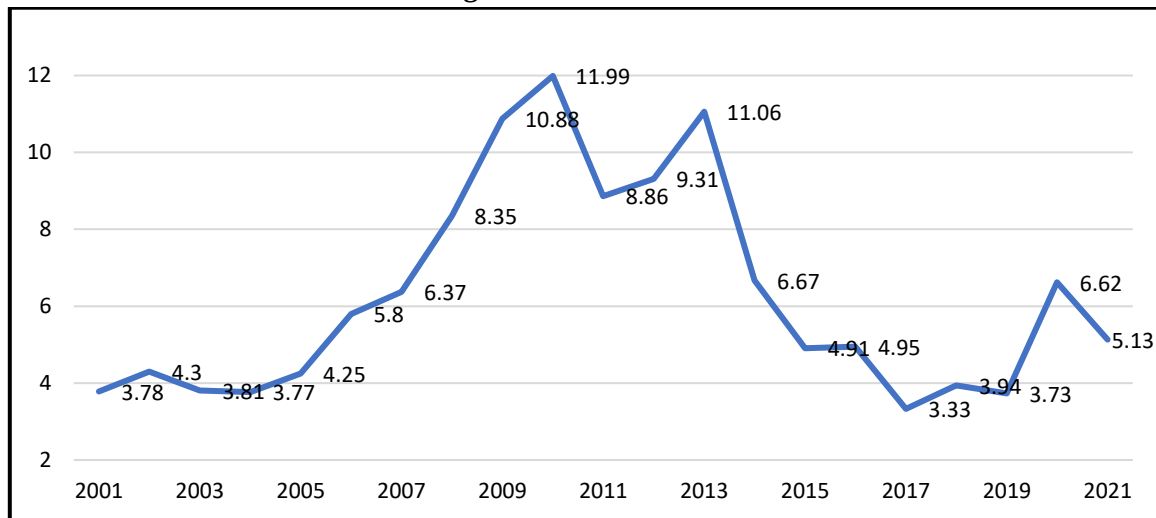
Inflation

The rate at which a nation's average level of prices for goods and services is rising over time is referred to as its inflation rate. The consumer price index (CPI), which is a selection of goods and services that represents the spending habits of households in that nation, is typically used to calculate inflation.

High inflation can have detrimental impacts on an economy, including decreasing consumer purchasing power, raising borrowing and lending costs, and decreasing global competitiveness. Low or moderate inflation, however, can be advantageous for an economy since it encourages consumption and investment, helps to keep prices stable, and fosters economic progress.

Monetary and fiscal policies are frequently used by central banks and governments to control inflation and preserve price stability. These measures can involve changing interest rates, managing the money supply, putting in place pricing restrictions, and encouraging economic expansion. The historical rate of inflation from 2000-01 to 2020-21 was collected from (Macrotrends, 2023) and presented in a line chart as given below.

Figure 4: Inflation Rate



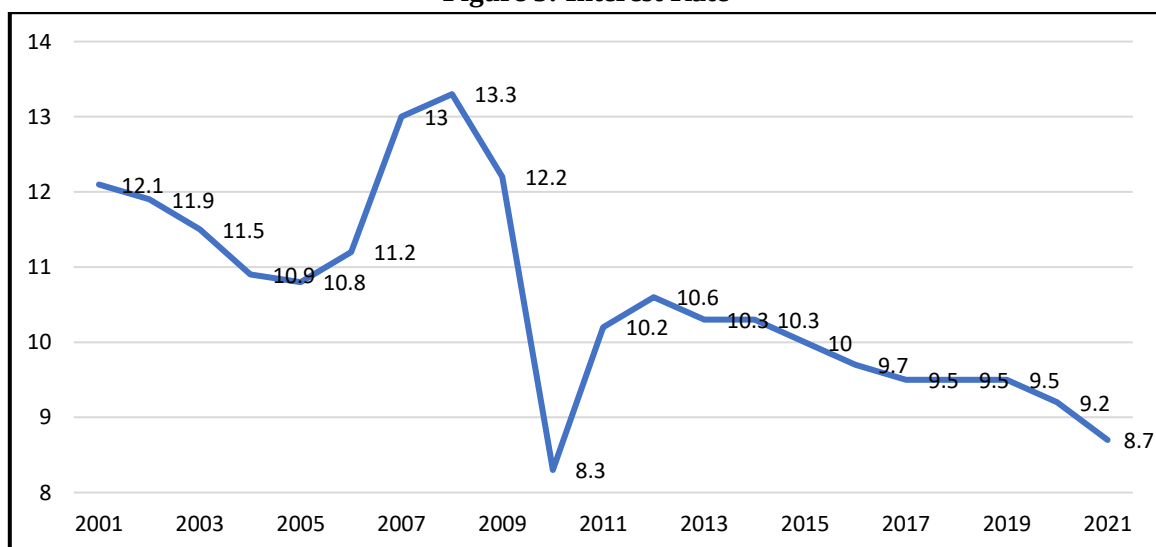
Interest Rate

The interest rate that commercial banks charge their most creditworthy clients for loans is known as the prime lending rate. Since many other lending rates, like mortgage and auto loan rates, are based on the prime lending rate, this rate acts as a benchmark for other interest rates in the economy.

The cost of borrowing money, inflation, and the state of the economy as a whole are taken into account when determining the prime lending rate by a nation's central bank or by commercial banks themselves. The benchmark interest rate set by the central bank, which is the rate at which banks can obtain loans from the central bank, is often higher than the prime lending rate.

The availability of credit and the cost of borrowing for both individuals and businesses can be impacted by the prime lending rate. When the prime lending rate is low, it may encourage consumers to borrow money and firms to make investments, which may boost economic growth. However, a high prime lending rate can increase the cost of borrowing and limit credit availability, which can impede economic growth. The prime lending rates from 2000-01 to 2020-21 was collected from (Reuters, 2023) and presented below.

Figure 5: Interest Rate



Currency Exchange Rate

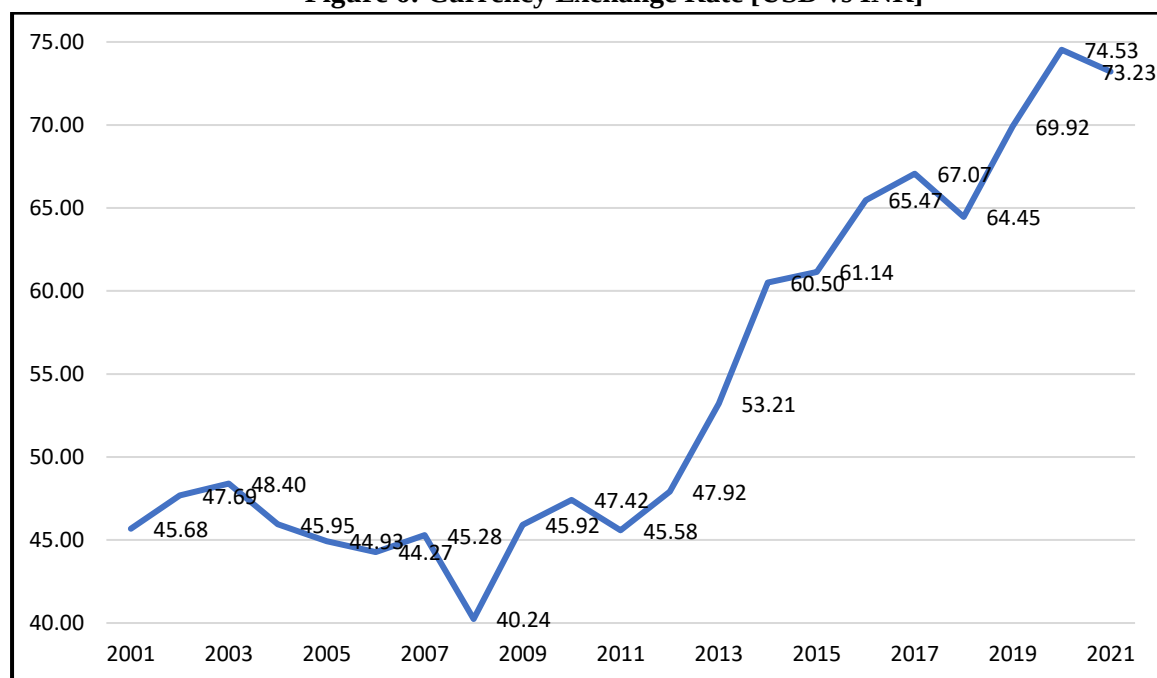
The rate at which one currency can be exchanged for another is referred to as the currency exchange rate. In other words, it is the exchange rate between the currencies of two nations.

The supply and demand of currencies on the foreign exchange market, where currencies are traded between banks, corporations, governments, and individuals, determines currency exchange rates. A number of variables, including economic conditions, political developments, interest rates, inflation, and trade flows, can cause changes in the exchange rate.

The effects of currency exchange rates on global investment, trade, and tourism can be profound. For instance, a strong currency exchange rate may reduce a nation's exports' competitiveness on the international market while increasing imports' affordability and consumer appeal. In contrast, a weak exchange rate can raise the cost of imports while lowering the cost of exports, increasing a nation's competitiveness.

In addition to altering interest rates, managing the money supply, and enacting trade policies, central banks and governments can also affect currency exchange rates. These measures may have an impact on a nation's currency's demand as well as its exchange rate on the foreign exchange market. The exchange rate between UD dollar and Indian rupee are collected for the study period from (Reserve Bank of India, 2023) and presented below.

Figure 6: Currency Exchange Rate [USD vs INR]



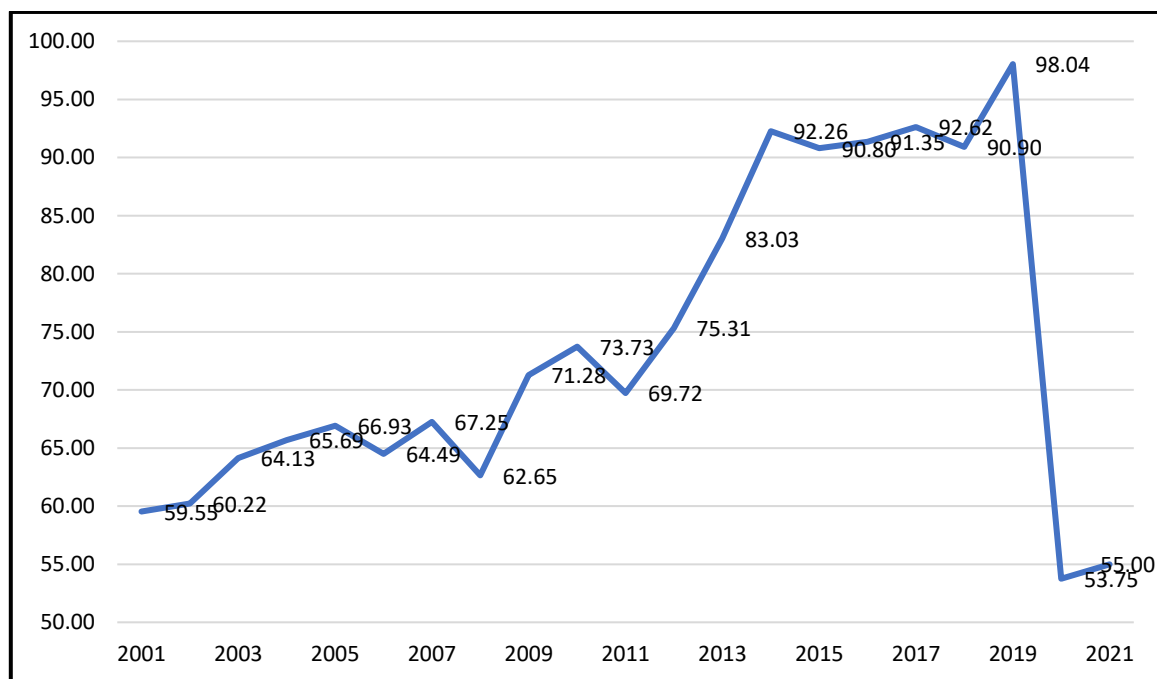
Special Drawing Rights, or SDRs, are a type of international reserve asset that the International Monetary Fund (IMF) established to supplement member nations' existing official reserves. SDR is a sort of monetary asset that is based on a basket of currencies rather than a currency itself.

A basket of currencies, which includes the US dollar, the euro, the Japanese yen, the British pound sterling, and the Chinese renminbi, determines the value of the SDR. Every currency in the basket is valued according to its proportion in the global trading and financial systems. Each currency's weight in the basket is evaluated every five years to make sure it accurately reflects its relative importance in the world economy.

The IMF and various other international organisations use SDR as a unit of account. It can also be used to pay for purchases made between member nations across borders. SDR is primarily used for sizable international transactions between governments and international institutions, although it is not a frequently utilised currency in day-to-day activities.

SDR may be used in currency exchange. For instance, if a member nation needs to increase its reserves, it can convert its SDR holdings into other currencies. In contrast, a nation can also add its own money to the SDR basket in return for SDR allotments, which can boost its foreign exchange reserves. The daily SDR valuation, which is based on the weighted average of the exchange rates of the currencies in the SDR basket, determines the exchange rate of SDR in relation to other currencies. The historical SDR values during the study period was collected and presented below.

Figure 7: Special Drawing Rights



Descriptive Statistics

The collected data were analysed using descriptive statistics and tabulated below.

Table 1: Descriptive Statistics

Particulars	Mean	SD	Median	Count	Skewness	Kurtosis
Current Account Balance [% of GDP]	-1.26	1.64	-1.10	21	-0.23	0.14
FDI Inflows [\$B]	30.09	17.27	34.58	21	-0.15	-0.73
GDP Growth [%]	6.06	3.36	7.41	21	-2.90	10.24
Inflation [%]	6.28	2.73	5.13	21	0.88	-0.50

Interest Rate	10.60	1.36	10.30	21	0.37	-0.50
USD – INR	54.23	10.98	47.92	21	0.65	-1.15
SDR	73.75	13.94	69.72	21	0.40	-1.25

From the above table it is clear that average FDI inflows to the country during the study period is about US \$30 billion, and the average GDP growth rate was around 6%. Further, average exchange rate between US dollar and Indian rupee was Rs.54.23, however, SDR rate stood up to 73.75. The highest volatility among the identified variables is found with FDI inflows, while the lowest was the current account balance, 17.27 and 1.64 respectively. The growth rate during the study period was not normal, as indicated by its Kurtosis value.

Correlation Matrix

Table 2: Correlation Matrix

Particulars	CAB	FDI	GDP	Inflation	Interest Rate	USD - INR	SDR
CAB	1.00	-	-	-	-	-	-
FDI	-0.23	1.00	-	-	-	-	-
GDP	-0.25	-0.42	1.00	-	-	-	-
Inflation	-0.65	0.17	-0.01	1.00	-	-	-
Interest Rate	0.18	-0.47	0.03	0.00	1.00	-	-
USD – INR	0.19	0.71	-0.29	-0.33	-0.72	1.00	-
SDR	-0.33	0.36	0.29	-0.07	-0.37	0.39	1.00

The correlation matrix between the variables identified are shown in Table 2. It is clear that the highest correlation was observed between currency exchange rate and foreign direct investment with the value of 0.71, while the lowest correlation of 0.03 was observed between interest rate and GDP. No correlation was found between interest rate and inflation rate. On the hand, negative correlation was also found between the variables, and among them the highest was found between currency exchange rate and interest rate.

Significant Influence of variables identified

Regression analysed was carried out to understand the significant influence of identified variables on the currency exchange rate between USD and INR. The exchange rate between USD and INR is considered as dependent variables while, current account, FDI, interest rate and inflation rate are considered as independent variables. The outcomes of the multiple regression with its ANOVA table are listed below.

**Table 3: Multiple Regression
Summary Statistics**

Multiple R	0.948
R Square	0.900
Adjusted R Square	0.867
Standard Error	4.003
Observations	21

ANOVA

	df	SS	MS	F	Significance F
Regression	5	2172.58	434.51	27.104	0.000
Residual	15	240.46	16.03		
Total	20	2413.05			

	Coefficients	Standard Error	t Stat	P-value
Intercept	92.095	10.055	9.158	0.000
CA Balance [% of GDP]	1.627	0.819	1.987	0.045
FDI Inflows in USD Billion	0.384	0.069	5.504	0.000
GDP Growth (%)	0.104	0.332	0.315	0.756
Inflation %	-1.122	0.449	-2.495	0.024
Interest Rate	-3.864	0.770	-5.014	0.000

The summary statistics confirmed that the values of correlation co-efficient and co-efficient of determination are higher than the standard values of 0.8 and hence, the data is valid to conduct the regression analysis. The ANOVA table and its significance value claims that the regression model is statistically significant and the significant influence of identified variables can be inferred from the regression model as given below in the regression equation.

$$Y = 1.627 X_1 + 0.384X_2 -1.122X_3 -3.864X_4 + 92.095$$

where

Y is the Currency Exchange rate between USD and INR

X₁ is the Current Account Balance [% of GDP]

X₂ is the FDI inflows in ISD Billion

X₃ is the Inflation Rate

X₄ is the Interest Rate

From the above table it is evident that macroeconomic variables like inflation rate, interest rate, FDI inflows and interest rate are significantly influencing the currency exchange rate and hence conclude that alternate hypothesis 1, 2, 3 and 5 are accepted, while the GDP rate is not significantly influencing the currency exchange rate.

CONCLUSION

The present study included six variables as independent variables to identify its significant influence on the currency exchange rate between USD and INR. From the detailed analysis it is evident that variables like current account balance, FDI inflows are influencing the exchange rate positively while, inflation and interest rate are negatively influencing the exchange rate between USD and INR. The GDP growth rate is failed to show its significant impact on the currency exchange rate.

One of the most significant variables affecting currency exchange rates is interest rates. Increasing interest rates might draw in foreign investment and boost currency demand. On the other hand, as

interest rates decline, the demand for the currency may decline. Similarly, a country's currency typically depreciates when it has significant inflation because it has less purchasing power. On the other hand, when inflation is low, the demand for the currency may rise. Overall, a wide range of macroeconomic factors can have complex and linked effects on currency rates. Before making any forecasts about how these variables may affect exchange rates, it is crucial to take into account the larger economic background and trends.

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