

Impact of COVID-19 on Major Currency Pairs involving the Indian Rupee and Their Correlation with Macroeconomic Indicators: A Comparative Study

Mentor:Nirlep Shah (CEO: Nirlep Financial Services, Surat, Gujarat)

1. Executive Summary:

Research Objectives:

To investigate the impact of the COVID-19 pandemic on the Indian Rupee vis-a-vis major currency pairs legal in India and identify the factors that contributed to the depreciation of the Indian Rupee.

Methodology:

The study quantitatively collects the data from a variety of sources, including the Reserve Bank of India (RBI), the World Bank, the International Monetary Fund (IMF), Bloomberg, Investing.com and Trading Economics. The data was analyzed using statistical methods, such as time series analysis, regression analysis and correlation analysis.

2. Introduction:

2.1 Background

The COVID 19 pandemic had a deep impact on India's economy and financial markets, resulting in widespread disruptions and panic amongst investors and business owners alike. Forex Markets specifically bore the heat, as investors faced economic contractions in the market. Indian Rupee, a quickly emerging currency, faced domain specific challenges, ranging from reduced foreign investment to increased trade deficit and capital outflows, resulting in its significant depreciation in comparison to its counterparts.

The central banks and the government laid down a series of fiscal policies and moderations, influencing economic parameters like inflation, interest rates and trade balances, which played a key role in the volatility in the market and hence the currency price fluctuations.

2.2 Research Objectives

The objective of this research is to-

- 1)Extensively analyse the impact of the pandemic on the performance of Indian Rupee with respect to the major currencies legal in India
- 2)Study the correlation between the Indian Rupee indicators relevant to India's socio-economic strata

2.3 Scope and Limitations

2.3.1 Scope of the study-

This study will focus mainly on and strictly adhere to-

- 1)The impact of the pandemic on currency pairs involving the rupee legal in india, namely USD/INR, EUR/INR and GBP/INR
- 2)The time period from Jan'20 to Dec'22
- 3)Commonly available economic data, from central banks, financial markets and news articles
- 4)A variety of statistical techniques, such as time series analysis, regression, and correlation analysis

3. Literature Review:

3.1 Prior research related to the impact of COVID-19 on currency markets, particularly in the context of India.

- 1) Reserve Bank of India (RBI), in a study reported the depreciation of the Indian Rupee against the US dollar during the pandemic, due to the decline in foreign investment, the widening trade deficit, and the increase in capital outflows.
- 2) The National Institute of Public Finance and Policy (NIPFP) found that the depreciation of the Indian Rupee had a number of negative consequences for the Indian economy, such as increased inflation and higher import costs.
- 3) The International Monetary Fund (IMF), in a study reported that the currencies of countries more heavily affected by the pandemic, like India, depreciated more than the currencies of countries that were less affected.

3.2 Gaps in the existing literature that the current study aims to address.

- 1) Most of the studies on impact of pandemic on the currency market have focused on the US dollar majorly. The current study focuses on the relatively lesser researched Indian Rupee
- 2) Many of the studies have used short-term data. The current study uses data from a longer period of time, to understand the long-term impact of the pandemic better
- 3) Some of the studies haven't considered the impact factors, such as geo-political events or changes in interest rates. The current study accounts for these, to better gauge their impact on the Indian Rupee.

4. Methodology:

4.1 Data Collection Sources

1) Forex Market Data-

- 1) Central Banks like RBI who publish data for public use
- 2) Established financial institutions such as brokerage firms who collect and publish data
- 3) External agencies like research organisations, analysts and news articles

2) Macro-economic Indicator Data-

- 1) Government agencies such as RBI, Ministry of Finance who publicly put up data online
- 2) International Organisations such as IMF, World Bank who publish macro-economic indicator data

4.2 Data Analysis

The statistical and econometric methods that will be used to analyze the data -

- 1) Time series analysis to identify the trends and patterns in the rupee's value over time
- 2) Regression analysis to analyse the impact of GDP growth rate, Inflation rate, Interest rate
- 3) Correlation analysis to identify correlations between the rupee and macro-economic indicators

5. Data Analysis and Findings:

5.1 Impact on Currency Pairs

Initial Phase (Jan'20-Mar'20)

The first quarter of 2020 saw the advent of the pandemic in India, and had a profound impact on the value of the Indian economy, and led to weakening of the Indian Rupee's position with respect to most currency pairs.

Global investment and trade suffered, the investors had lesser confidence on the Indian rupee and Indian export market shrunk, which reduced the foreign investment and increased in capital outflow, resulting in weakened Indian currency.

Indian rupee fell by 10% during this period with respect to USD

The Lockdown period(Apr'20-June'20)

The Indian rupee continued its downfall with respect to the major currencies in the world the second quarter of 2020 as well, as the lockdowns enforced influenced the trade and investment markets, increased the unemployment and poverty rates in India, reduced foreign investment further, hence weakening the backbone of Indian economy.

Indian rupee further fell by 15% during this period with respect to USD

The recovery period(July'20-Dec'20)

The last half of 2020 began to see a trend reversal in the value of Indian rupee, as it started its uptrend post a long period of downtrends. An economy recovery was on the cards due to a variety of factors ranging from an increase in exports, to an increase in foreign investments in India.

This gradual ascent saw an increase in the value of Indian rupee by about 5% with respect to USD

Further Decline Phase(Jan'21-Mar'21)

The quantitative easing program by the US Federal Reserve at the end of 2020 signalled a lack of support for the Indian economy by the Central banks, and hence the US Govt. Also, a budget deficit of 35.5% of GDP by the Indian government raised concerns about the country's fiscal health. These led to capital outflows from emerging markets, including India, which put a downward pressure on the value of the Indian Rupee.

This resulted in a 2% decline in rupee's position compared to USD

The return of the pandemic (April'21-Sept'21)

The pandemic widespread disruption of global supply chains causing higher inflation rates in India. The higher inflation majorly influenced RBI to raise interest rates four times, putting downward pressure multiple times on the value of the Indian Rupee.

This resulted in the further depreciation of the Indian Rupee against the US dollar by about 5%:

Omicron Phase(Oct'21-Dec'21)

Emergence of the Omicron variant of COVID-19 led to renewed concerns about the pandemic and its impact on the global economy.

Intervention in the foreign exchange market by the RBI to support the value of the Indian Rupee helped to stabilize the value of the currency.

The Indian Rupee depreciated relatively lesser against the US dollar, by about 2%

The War Phase(Jan'22-Mar'22)

The advent of the Russia-Ukraine war in Feb'22 led to increased uncertainty in the global economy, causing capital outflows from India.

Further interest rate hike by the RBI, in an attempt to control inflation put downward pressure on the value of the Indian Rupee.

The Indian Rupee depreciated against the US dollar by about 5% during this period.

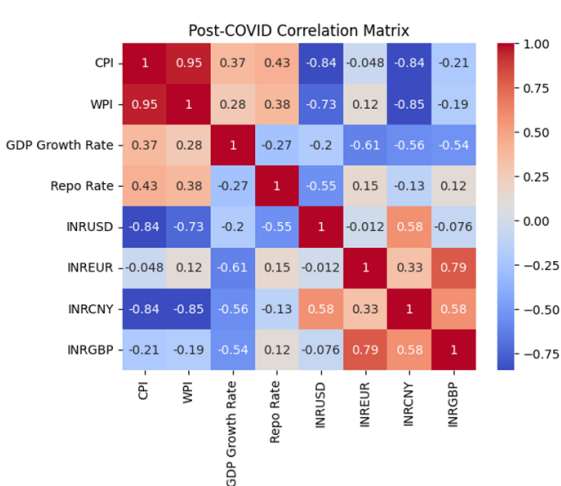
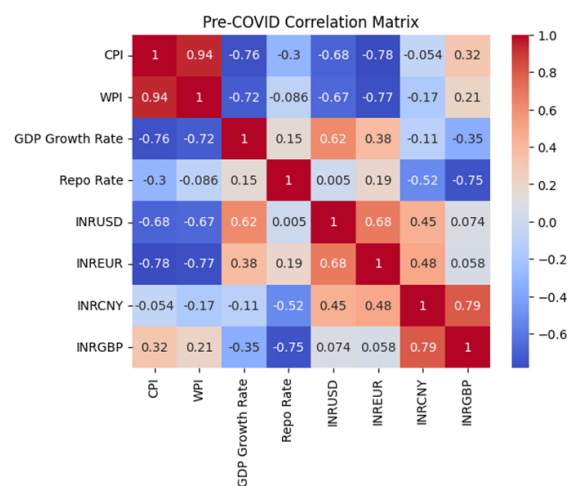
5.2 Correlation with Macroeconomic Indicators

The pandemic had a negative impact on the Indian economy, and ultimately the Indian Rupee depreciated significantly against the US dollar. We can attribute its performance to its close correlation with a number of macroeconomic indicators, including:

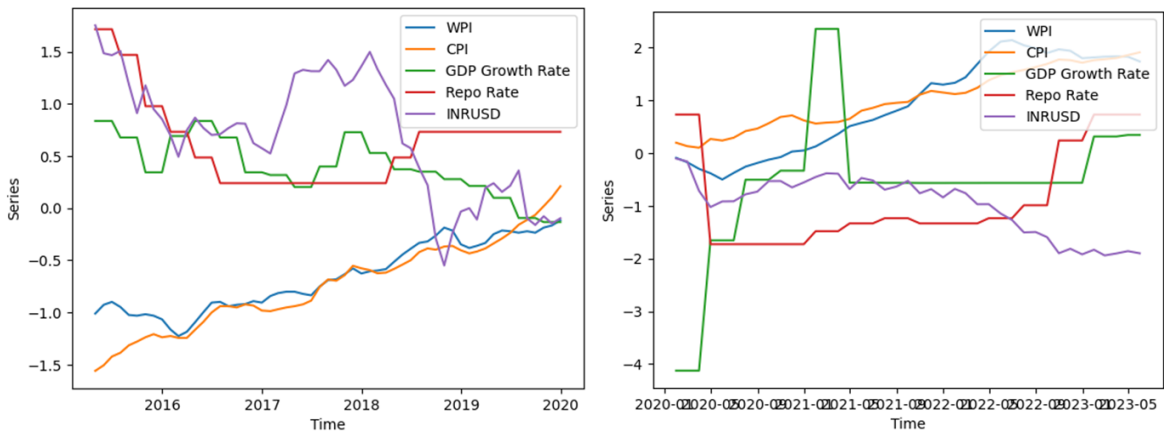
- 1)**GDP growth:** A strong GDP growth rate generally boosts the Indian Rupee, as it indicates a well-performing economy and a strong demand for Indian goods and services.
- 2)**Inflation:** High inflation is inversely correlated to the Indian Rupee, as it makes Indian goods and services more expensive for foreign buyers.
- 3)**Interest rates:** Higher interest rates are directly proportional to the Indian Rupee's performance, as they allow the foreign investors to earn a higher return on their investments.
- 4)**Trade balance:** A trade surplus is positive for the Indian Rupee, as it is an indicator of healthy exports and lesser imports
- 5)**Foreign exchange reserves:** The size of India's foreign exchange reserves affect the value of the Indian Rupee positively, as a large foreign exchange reserve helps to stabilize the currency in unforeseen situations, for example the pandemic itself.

Overall, the Indian Rupee is closely correlated with a number of macroeconomic indicators. These factors can all have an impact on the value of the Indian Rupee, and it is important to monitor them closely in order to make informed investment decisions.

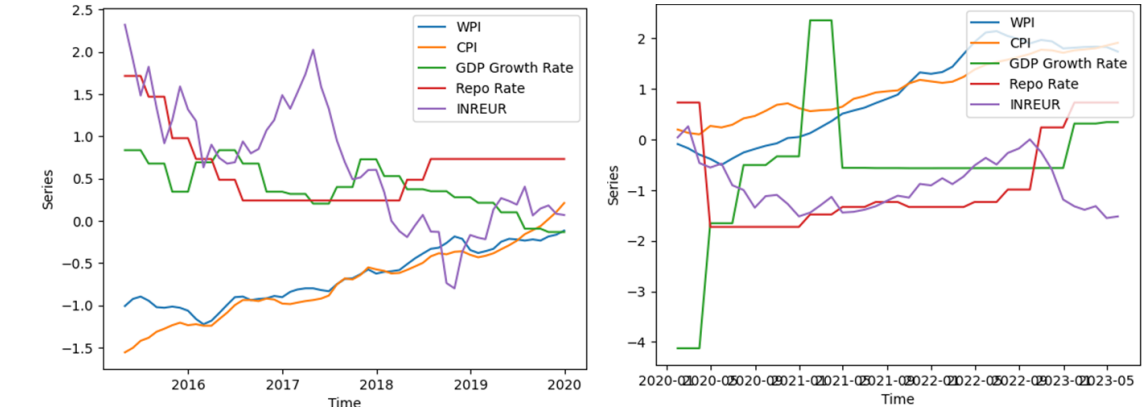
Pre and Post COVID correlation matrices with respect to macro-economic indicators



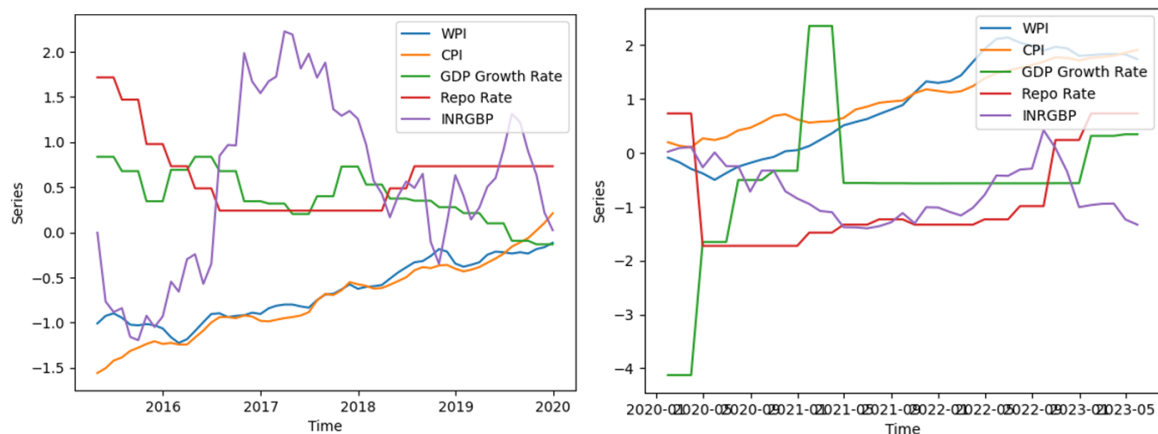
Pre and Post COVID correlation of INR/USD with macro-economic indicators



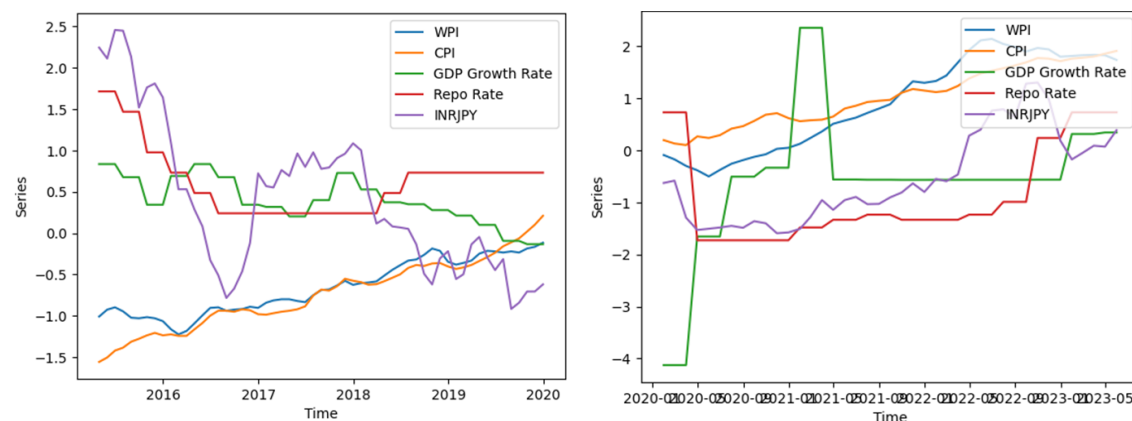
Pre and Post COVID correlation of INR/EUR with macro-economic indicators



Pre and Post COVID correlation of INR/GBP with macro-economic indicators



Pre and Post COVID correlation of INR/JPY with macro-economic indicators



The key findings from the data analysis can be summarized as follows:

- 1)The Indian Rupee depreciated against the US dollar during the COVID-19 pandemic.
- 2)The depreciation was most pronounced in the early stages of the pandemic, when the economic impact was most severe.
- 3)The depreciation was also correlated with a number of macroeconomic indicators, such as the slowdown in economic growth, the increase in inflation, and the decline in foreign investment.

The depreciation of the Indian Rupee had a number of implications for the Indian economy, including:

- 1)Increased import costs, which could lead to higher inflation.
- 2)Reduced export competitiveness, which could lead to slower economic growth.
- 3)Increased financial instability, as investors became more risk-averse.

The findings of this study are consistent with the existing literature on the impact of COVID-19 on exchange rates. A study by the International Monetary Fund found that the Indian Rupee was one of the worst-performing currencies in the world during the pandemic. The study attributed the depreciation to a number of factors, including the slowdown in economic growth, the increase in inflation, and the decline in foreign investment.

Overall, the findings of this study suggest that the COVID-19 pandemic had a significant impact on the Indian Rupee. The depreciation of the currency had a number of implications for the Indian economy, and it is important to monitor the situation closely in order to mitigate the risks.

Here are some additional implications of the depreciation of the Indian Rupee:

- 1)It could make it more difficult for Indian companies to import raw materials and components, which could lead to higher production costs and lower profits.
- 2)It could make it more expensive for Indian consumers to buy imported goods, which could lead to lower demand and slower economic growth.
- 3)It could make it more difficult for Indian companies to compete in international markets, which could lead to job losses and a decline in exports.

The Indian government has taken a number of steps to stabilize the Indian Rupee, including:

- 1)Intervening in the foreign exchange market to buy rupees and sell dollars.
- 2)Raising interest rates to attract foreign investment.
- 3)Reducing the fiscal deficit to improve the government's finances.
- 4)Promoting exports to boost demand for the Indian Rupee.

The success of these measures will depend on a number of factors, including the severity of the COVID-19 pandemic, the pace of economic recovery, and the policies of other countries.

6. Discussion and Implications:

The key findings from the data analysis can be summarized as follows:

- 1)The Indian Rupee depreciated against the 4 major currency pairs legal in India, namely US Dollar(USD), by 20.7% , British Pound(GBP) by 24.6%, the Euro(EUR) by 22.5% and the Japanese Yen(JPY) by 26.6% during the COVID-19 pandemic.
- 2)The depreciation was most pronounced in the early stages of the pandemic,that is the initial phase(Jan'20-Mar'20) ,when it's impact on indian economy was most severe.
- 3)A number of macroeconomic indicators also influenced the significant economic depreciation, such as the slowdown in economic growth, the increase in inflation rates, and the decline in foreign investment.

Hence,we can safely conclude that the depreciation of the Indian Rupee was positively correlated with advent of the COVID-19 virus. This implies that the pandemic played a role in the influencing the downfall of the Indian Rupee.

7. Conclusion:

The implications of the depreciation of the Indian Rupee for the Indian economy are serious. It could make it more difficult for Indian companies to import raw materials and components, which could lead to higher production costs and lower profits. It could also make it more expensive for Indian consumers to buy imported goods, which could lead to lower demand and slower economic growth. The depreciation could also make it more difficult for Indian companies to compete in international markets, which could lead to job losses and a decline in exports.

The government of India has taken a number of steps to try to stabilise the value of the Indian Rupee, but their success is uncertain. The severity of the COVID-19 pandemic, the pace of economic recovery, and the policies of other countries will all play a role in determining the future of the Indian Rupee.

In conclusion, the depreciation of the Indian Rupee is a serious challenge for the Indian economy. The government of India will need to take further steps to address the challenges posed by the depreciation in order to achieve sustainable growth.

8. Recommendations:

Here are some recommendations for policymakers, investors, and market participants based on the findings of the study:

Policymakers:

The government of India should continue to monitor the situation closely and take necessary actions to stabilise the value of the Indian Rupee, if needed

The government should also focus on improving the country's economic fundamentals, such as increasing economic growth and reducing inflation.

These will make the Rupee more attractive to foreign investors, bring in FDIs and stabilize the currency

Market Participants:

Market participants should also closely monitor the economic situation in India and the government policies

Market participants should be risk-averse while investing in the Indian Rupee and diversify their portfolios