



Exploring the Interplay Between Inflation, Currency Depreciation, and Macroeconomic Metrics in India

A Research Paper

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1. Abstract

This research explores the complex interactions between inflation, currency depreciation, and key macroeconomic indicators within the context of India's rapidly evolving economy. Employing empirical analysis and econometric modelling, the study unveils a symbiotic relationship between inflation and currency depreciation, demonstrating their mutual influence. Additionally, it uncovers how these factors impact critical metrics such as GDP growth, trade balances, foreign exchange reserves, and interest rates. The findings underscore the need for a comprehensive policy approach to address these interconnected dynamics, offering valuable insights for policymakers, economists, and financial analysts navigating India's economic landscape. In conclusion, this research enhances our understanding of the intricate interplay between inflation, currency depreciation, and macroeconomic



metrics in India, providing a foundation for informed economic policy decisions and contributing to the ongoing discourse surrounding India's economic stability and growth prospects

2. Introduction

A steady increase in price that over time results in a loss of buying power is referred to as inflation. The average price increase of a selection of products and services over time can serve as a proxy for the rate at which buying power declines. It enables a single value representation of the rise in the cost of goods and services over time in an economy. (Mirchandani, 2013a; Sameer & Pallavi, 2023)

The expansion of the money supply is the primary source of inflation. The purchasing power of money decreases as its quantity increases. (*The Rupee Depreciated 7.8% in FY23*, n.d.)

Currency depreciation is the decrease in a currency's value when compared to other currencies.

Political unrest, interest rate differences, weak economic fundamentals, and investor risk aversion are a few examples of the causes of currency devaluation.

The following factors lead to currency devaluations:

1. To increase exports
- 2) Reduce trade deficits(Behera et al., 2008)
3. To lessen the responsibilities of sovereign debt

In July 2023, India's retail inflation reached a 15-month high of 7.44%, while the WPI inflation rate fell for the fourth consecutive month to (-)1.36%. The CPI measurement has now exceeded the Reserve Bank of India's upper tolerance medium-term target of 4% within a range of +/- 2% three times this year.

The Reserve Bank of India (RBI) has opted to halt rate hikes and maintain the benchmark repo rate at 6.50% in light of rising costs, particularly for vegetables as a result of unequal rainfall distribution and disruption. Das asserts that the monetary policy committee will take additional monetary actions as needed to keep inflation expectations firmly anchored and to lower inflation to the target rate promptly and effectively. (*Inflation Rate In India: September 2023 Data*, n.d.)

For 2023–2024, the RBI anticipates that the CPI will increase by 5.4%. Real GDP growth is anticipated to be 6.5% during the period, with Q1 increasing by 8.0%.

Meanwhile, according to the U.S. inflation rate for July 2023, the consumer price index rose 3.2%. The country's GDP increased to 2.4% between April and June.

In FY23, the rupee lost 7.8% of its value, the most since 2019–20. In 2022, the rupee lost more than 10% of its value, outperforming nearly other Asian currencies. It was 82.18 to the dollar at the end of the 2023 fiscal year. The rupee depreciated to its lowest point in October 2022, when it reached 83.28, as the current account deficit for the year changed to a surplus in the final three months.

The aggressive monetary tightening by the US Federal Reserve was blamed for the decline in the value of the rupee and other currencies relative to the US Dollar.

As a result, numerous rising economies, including India, are losing foreign money, which is exerting pressure on their national currencies.

The inflationary process has remained a controversial topic in both theory and empirical findings. It is generally arguable that whether inflationary pace is a good or bad for the economies. It raises a question before the policy makers that how to achieve the twin goal of low inflation and low unemployment. It has been observed that high inflation reduces savings and divert investment into speculative channels. The countries are worried that high inflation will swell the goal of achieving high economic growth. This is explained by well-known Phillips curve advocating the possible trade-off between inflation and unemployment (Phillips, 1958). The curve establishes that there is no trade-off between the inflation



and unemployment in the long-run but there are a possible trade-off between inflation and unemployment in the short-run.(Alam & Alam, 2016a)

India has embarked on a series of structural reforms in the foreign exchange market since 1990s. Exchange rate policy has been evolved over time in line with the gradual opening up of the economy as a part of the broader strategy of macroeconomic reforms. One of the important reforms was two step downward adjustment of Indian Rupee in order to install investors' confidence & boost domestic competitiveness. Indian Rupee was devalued two times in July 1991 in order to stabilize the foreign exchange market. These were decisive steps to end pegged exchange rate regime. During this era most of the academia & economists argued for establishment of Flexible Exchange Rate regime. (Mirchandani, 2013c)

There were two arguments in the favour of Flexible Exchange Rate System. The first argument is related to the competitive position of a country in the international market. For e.g. if a price level in a country rises, it will make its products & services uncompetitive in international market and the balance of payments will suffer from a deficit. In order to keep equilibrium in the balance of payments, the country may use various macroeconomic policies to reduce the price level, and because prices are sticky-downwards this may lead to painful adjustment and may result in welfare losses. (Chhabra & Alam, 2020)

Therefore it is better, to leave the exchange rate to depreciate to compensate for the rise in price level and to keep the competitive position of the country without a need to undergo such long and painful adjustment.

The second argument of the proponents of flexible exchange rates is built upon the assumption that the stabilizing behaviour of speculators will make exchange rates relatively stable compared to fixed rates. For instance, if a currency depreciates from its long run value, speculators would know that the move is temporary, hence, would buy the currency since it is expected to appreciate in the future. Therefore, they stabilize the exchange rates' actual movements.(Mirchandani, 2013b)

There exist a very strong association between the exchange rate regime and the economic growth. Although, it is very difficult to establish the correlation between the exchange rate and inflation with respect to overall economic growth yet the exchange rate is correlated to growth and inflation directly as well as indirectly. The major impact on exchange rate is due the change in inflation yet there many other economic variables that affect the exchange rates.(Anwer, 2019)

3. Literature Review

2.1 Economic Implications of Inflation and Currency Depreciation

The events of the last decade or two have provided cumulative empirical evidence that macroeconomic factors in general, and the macro-policy response to external shocks, in particular, play a dominant role in countries' protracted growth crises as well as in growth renewal and its long-run sustainability. One tends to distinguish between policies that deal with adjustment (centred on inflation and the balance of payments) and those that take care of structural reform (mainly targeted on productivity and growth) as if that division of instruments can be clearly made. (W4422, n.d.)

The inflationary process has remains a controversial topic in both theory and empirical findings. It has been observed that high inflation reduces savings and divert investment into speculative channels. The countries are worried that high inflation will swell the goal of achieving high economic growth. The empirical studies have observed a negative relationship between inflation and output-gap in India (Roy and Darbha, 2002; Nachane and Lakshmi, 2002; Virmani, 2012). Gordon (2011) found that there is no



positive correlation between inflation and output-gap and it depends on the relative importance of supply shock and aggregate demand. (Alam & Alam, 2016b)

The flexible exchange rate system also protects a country from adverse external shocks. Under the Bretton Woods system a decrease in the demand for the exports of a country would cause a domestic contraction in this country. However, under a flexible exchange rate system the exchange rate would adjust to compensate for the shock, maintaining equilibrium in the current account and competitiveness and subsequently the level of demand. This merit of a floating exchange rate regime also gives the country the opportunity to exert an independent monetary policy. (Mirchandani, 2013c)

However one of the most controversial features of Flexible Exchange Rate system is the high volatility of Exchange rate. Volatility represents the degree or the extent to which one variable changes over a time period. The larger the magnitude of a variable change, or the more quickly it changes over time, the more volatile it is. (Mirchandani, 2013c)

A study by Pattnaik and Mitra (2001) indicates that interest rates, inflation rates and exchange rates are all highly correlated. The real exchange rate is the actual exchange rate adjusted for inflationary effects in the two countries of concern. Another study by Ndung'u (1997) states that interest rate differential will widen with real exchange rate appreciation, and this will trigger capital inflows. A study by Sifunjo, (2011) further found that the derivation of the rer therefore, requires that the data of the ner, domestic inflation and foreign inflation be obtained. Domestic inflation will rise with exchange rate depreciation, and the influence of foreign inflation will decrease with exchange rate appreciation. Nevertheless, no study has been carried to satisfactorily indicate how such in relation can affect the exchange rates either positively or negatively. This study therefore sought to cover the interrelation between inflation and exchange rate. (Anwer & Limited, n.d.)

2.2 Indian perspective of relationship between inflation, currency depreciation and macroeconomic indicators

Inflation, the persistent increase in the prices of goods and services, is widely acknowledged as a hindrance to economic growth and fairness in society. This belief has led to the emergence of low and stable inflation as a primary goal of economic policies worldwide. Notably, in recent years, numerous countries, regardless of their developmental stages, have experienced a decline in inflation rates. India's experiences with inflation were very varied. The yearly inflation rate occasionally reached a high of 40%, while other times it showed negative digits. The WPI index showed a wide variation, with the highest value, 38.3%, recorded in 1943–1944 and the lowest value, -12.5%, recorded in 1952–1953. The end of World War II was the main cause of the surge in inflation that occurred during that time. Years of high inflation were primarily caused by elements like the effects of war, decreased agricultural output as a result of drought, and rises in global oil prices. (Karthikeyan & Manikandan, 2019)

The inflation rate within the Indian economy exhibited distinct shifts over the years. It began with an average annual rate of 6.4% during the 1960s, which then escalated to 9.0% in the 1970s before experiencing a minor dip to 8.0% in the 1980s. This upward trend in inflation was primarily propelled by heightened aggregate demand resulting from increased government spending and expanded fiscal deficits. As the 1980s drew to a close, the economy found itself operating above the usual production levels, with fiscal policies maintaining an expansionary stance, thereby generating surplus demand within the economy. Subsequently, during the 1990s, the inflation rate surged by 7.8%. This increase was attributed to both monetary expansion and bottlenecks in supply, largely stemming from rising oil prices and crop failures. By the year 2009-10, there was a notable reduction in the annual inflation rate, which receded to 7.1% from its previous peak of 13.7% recorded in 1990-91. (Alam & Alam, 2016c)



The study by (Kalani & Sarin, n.d.) reveals that within the various components contributing to WPI inflation, fuel and power prices display the highest degree of fluctuation, closely followed by non-food articles. In contrast, manufactured goods, which make up the largest portion of the inflation index, exhibit the least amount of variation and consistently maintain the lowest average quarterly inflation rates. Furthermore, the study highlights a consistent pattern where food prices experience inflation rates consistently higher than the underlying inflation. Additionally, manufactured products, which carry the greatest significance in the Wholesale Price Index (WPI) composition, have consistently mirrored the trajectory of the headline inflation rate.

In a comparable study published in 2016, (Mohammad et al., 2017) came to the conclusion that inflation is a constant factor in a dynamic economy, underlining the importance of effective policies with an emphasis on managing inflation.

(Mohaddes & Raissi, 2014) conducted a study that utilized data spanning from 1995-96 to 2012-13. The findings indicated the existence of a specific threshold level for inflation. In the Indian context, it was observed that inflation has a negative impact on long-term economic growth. However, the study reveals a significant threshold effect when inflation reaches a rate of 5.5% or higher. Beyond this threshold, the detrimental impact of inflation on economic growth becomes more severe. This implies that monetary policy in India should carefully consider the trade-off between short-term growth and inflation. It becomes crucial to strike a balance while keeping in mind the long-term adverse consequences of consistently high inflation on economic growth and maintain the allocative efficiency of the Indian economy by keeping inflation below the threshold.

The effects of the inflation spread to India's currency exchange rate, which resulted in the devaluation of the rupee. A study by (Singh, 2009) shows the effect of the Indian rupee's devaluation in 2008 benefited the exports of commodities from the falling rupee, especially in export-driven industries including sugar, cotton, information technology, and auto components. Nonetheless, the cost of key imports such as capital goods, fertilisers, and crude oil had skyrocketed, forcing Indian companies that rely on imported raw materials to confront restrictions and tariffs. This condition also made it difficult to service debt in dollars, which led the Reserve Bank of India to hike interest rates as a countermeasure to devaluation even if inflation skyrocketed out of control.

A study conducted by (Rajender Singh et al., 2022) highlights a unique aspect of the economic consequences resulting from the depreciation of the Indian Rupee (INR). This particular scenario deviates from conventional economic theories due to the distinctive nature of India's main imported commodity, the crude oil basket, which exhibits lower elasticity. Consequently, this lack of elasticity contributes to a negative impact on India's balance of payments. The depreciation of the currency is a matter of grave concern due to its potentially devastating effects on India's economic fundamentals, which have already been strained by global factors. It is suggested that the government should make bonds available to non-resident investors, a move that could boost the influx of foreign currency into the country.

To address this crisis, the government needs to focus on improving sectors that are heavily reliant on exports and also consider the development of industries that can substitute imports. This strategy would reduce India's dependence on imported goods, contributing to a more resilient and sustainable economic outlook.

2.3 Global perspective of relationship between inflation, currency depreciation and macroeconomic indicators

In recent years, the role of global factors in shaping domestic inflation processes has gained increasing attention in economic research. Notably, (Borio & Filardo, 2007) highlighted the significance of the



global output gap as a determinant of domestic inflation, finding that proxies for global economic slack added considerable explanatory power to traditional inflation equations in advanced economies. However, it is important to note that common changes in unit labor costs also emerged as crucial in determining domestic inflation (Borio & Filardo, 2007) emphasized that these global factors, along with import prices, foreign competition, and global interest rates, should be carefully monitored by policymakers to understand and manage inflation dynamics (Mikolajun & Lodge, 1948)

Building on this foundation, subsequent research has underscored the importance of global factors on a broader scale. (Ciccarelli et al., n.d.) noted significant co-movements in inflation rates among advanced economies and found that models incorporating a measure of global inflation consistently improved benchmark national inflation forecasts. This viewpoint was supported by (Neely & Rapach, 2011), who conducted an analysis encompassing a larger group of countries and employed dynamic factor models. Their findings revealed that, on average, over half of the variation in domestic inflation was explained by an "international" component, be it at the global or regional level. Similarly (Mumtaz & Surico, 2012) adopted a comparable approach but focused exclusively on industrialized economies. Their research confirmed that both the level and persistence of domestic inflation were reasonably well tracked by a single global factor. Collectively, these strands of literature collectively argue for a shift in modeling inflation as a global, rather than strictly national, phenomenon (Mikolajun & Lodge, 1948)

The increasing prominence of global factors in shaping domestic inflation dynamics can be attributed to various factors. One perspective suggests that globalization has made national inflation less responsive to domestic capacity constraints. This is due to factors such as the translation of increased demand for goods into higher imports instead of higher domestic prices. Another argument highlights the role of credible monetary policies that have stabilized inflation expectations and trend inflation (Mishkin, 2009).

Furthermore, several channels link inflation rates across different countries. Fixed exchange rate systems, including unilateral pegs, the Bretton Woods system, or the European Economic and Monetary Union (EMU), require participating countries to adopt similar monetary policies. Additionally, common macroeconomic shocks, such as oil price fluctuations, have the potential to link international inflation rates. The fact that central banks may respond similarly to these common shocks further amplifies movements in inflation rates across countries (Henriksen et al., 2011). In summary, a variety of macroeconomic shocks, as well as economic and political pressures for central banks to respond similarly to shocks, are capable of producing movements in inflation rates across countries. (Neely & Rapach, 2011)

Empirically addressing the extent to which countries' inflation rates move together is crucial. (Neely & Rapach, 2011) tackled this issue by applying a dynamic latent factor model to 64 national inflation rates over the postwar era (1951–2009). Their findings were enlightening, indicating that international components significantly influenced national inflation rates. Specifically, the world factor explained an average of 35% of annual inflation variability across the 64 countries, with regional factors explaining 16% of inflation variability on average. The remaining 49% was attributed to country-specific components, highlighting the intricate interplay between global and national factors in driving inflation (Neely & Rapach, 2011)

In addition to empirical evidence, historical trends in global macroeconomic developments have shed light on the behavior of inflation rates worldwide. (Ciccarelli et al., n.d.) noted that inflation rates have exhibited strikingly similar long-term swings across all OECD countries. Inflation progressively rose during the 1960s and 1970s before declining in the 1980s. Subsequently, it further declined in the early to mid-1990s and remained low and stable thereafter. However, a more recent perspective revealed that



inflation rates began accelerating in many countries in 2007 and early 2008, suggesting ongoing dynamics in global inflation trends (Ciccarelli et al., n.d.)

Ciccarelli and Mojon (2010) note significant co-movement in advanced economy inflation rates and find that models which include a measure of global inflation consistently improve benchmark national inflation forecasts. Neely and Rapach (2011) support their view. By analysing a larger group of countries in a dynamic factor model setting they find that on average over half of variation in domestic inflation is explained by an "international" (world or regional) component. (Mumtaz & Surico, 2012), follow a similar approach but focus only on industrialised economies. They confirm that both the level and persistence of domestic inflation are reasonably well tracked by a single global factor. Taken together these strands of the literature suggest that inflation should be modelled as a global rather than a national phenomenon. (Mikolajun & Lodge, 1948)

While these factors have the potential to create common fluctuations in national inflation rates, it is essential to recognize that a country's inflation rate can behave idiosyncratically if its central bank pursues monetary policies that substantially differ from those of the rest of the world. Therefore, the interplay between global and national factors in determining inflation dynamics is a complex one that depends on various policy choices and economic conditions.

4. Objectives

The researchers endeavour to answer research questions based on the following broad objectives:

- 1) To study the nature of inflation in India.
- 2) To study the impact of inflation on macroeconomic indicators in India.
- 3) To study the impact of currency depreciation on macroeconomic indicators in India.

5. Research Methodology

This section discusses the research methodology adopted to address the objectives set out in this paper. Secondary research has been conducted to find the data required for the analysis. Various journals, research papers, government databases and statistical databases were used in depth.

5.1 Nature of Inflation in India

Food and Non-Food Inflation

For the period beginning in January 2017 and ending in July 2023, data for the monthly WPI and CPI were gathered from the data repository of the RBI. Separating the food and non-food components led to a new calculation of the index numbers ($\text{Index1}/\text{Index0} - 1$). Following this, the inflation rate for the food and non-food index figures was determined.

Rural and Urban Inflation

The monthly rural and urban CPI for the period beginning in January 2017 and ending in July 2023 was obtained from the data repository of the RBI. The inflation rates for the rural and urban indices were determined.

5.2 Effects of Inflation on Macroeconomic Indicators in India

Impact on Net National Income per Capita

From 1971 through 2021, figures for the inflation rate and net national per capita income were gathered from the World Bank data repository.

Impact on Unemployment

From January 2016 through June 2023, monthly data on the unemployment rate and inflation rate were gathered from the World Bank data repository.

Impact on Stock Market Returns



Data for the monthly CPI for the period beginning in January 2017 and ending in July 2023 was acquired from the data repository of the RBI. The information regarding stock market returns was gathered from the website of BSE India. The Sensex Index of the S&P was used to calculate returns.

5.3 Effects of Currency Depreciation on Macroeconomic Indicators in India

Impact on Net Exports

For the period beginning in January 2017 and ending in June 2023, data for monthly net exports (gross exports minus gross imports) were gathered from the World Bank's World Integrated Trade Solution (WITS). The Federal Reserve Bank of St. Louis' Economic Research repository provided data for the monthly spot exchange rate (USD/INR) for the time period beginning in January 2017 and ending in June 2023.

Impact on External Debt

Data for the external debt levels for the three months ending in March 2023 were derived from the data archive of the RBI. For the period beginning in March 2004 and ending in March 2023, data for the quarterly spot exchange rate (USD/INR) were acquired from the Economic Research repository of the Federal Reserve Bank of St. Louis.

6. Data Analysis

6.1 Nature of Inflation in India

Food and Non-Food Inflation

Since it has been a socioeconomic ill for many years, food inflation has been a significant contributor to total inflation in India. Understanding whether food inflation is statistically substantially different from non-food inflation based on India's two primary inflation indices, the Wholesale Price Index (WPI) and Consumer Price Index (CPI), is crucial to understanding the nature of inflation in that country.

H_0 : Food inflation is equal to non-food inflation based on the Wholesale Price Index (WPI) and Consumer Price Index (CPI).

H_1 : Food inflation not equal to non-food inflation based on the Wholesale Price Index (WPI) and Consumer Price Index (CPI).

Independent Samples T-Test

		Statistic	df	p
CPI	Student's t	2.0309	16.0000	0.05923

Note. $H_a \mu_{\text{Food}} \neq \mu_{\text{Non food}}$

Table 1: Independent T-Test between Food and Non-Food CPI

Source: The jamovi project

The researchers ran an independent samples T-test on CPI inflation data for the food and non-food categories. Since the data was normally distributed, i.e the p value for the normality test was more than 0.05, the Student's T test was used. With a p-value of 0.05923 , which is >0.05 the inflation of food components of CPI is not significantly different from non-food components of inflation. Hence, we fail to reject the null hypothesis.



Independent Samples T-Test

		Statistic	df	p
WPI	Student's t	3.2412 ^a	16.0000	0.00511

Note. $H_a \mu_{Food} \neq \mu_{Non\ food}$

Table 2: T-Test between Food and Non-Food WPI

Source: *The jamovi project (2021)*

The researchers ran an independent samples T-test on CPI inflation data for the food and non-food categories. Since the data was normally distributed, i.e the p value for the normality test was more than 0.05, the Student’s T test was used. With a p-value of 0.00511, which is < 0.05 the inflation of food components of WPI is significantly different from non-food components. Hence, we reject the null hypothesis.

It is a well-known fact that food and fuel inflation contribute the most to high inflation in India. In fact, food inflation based on WPI food index increased from 0.65% in December 2022 to 2.95% in January 2023 pushing the overall inflation rate to 4.73%. Hence, difference in non-food inflation and food inflation are statistically significant.

However, food inflation measured by the Consumer Food price index which accounts for nearly half of the overall consumer price basket, rose to 4.49% in June 2023 against 2.96% (revised) in May 2023. Perhaps, due to fuel inclusion in non-food component, the difference in inflation of non-food and food is not statistically significant.

Rural and Urban Inflation

H_0 : Rural CPI inflation is equal to urban CPI inflation.

H_1 : Rural CPI inflation is not equal to urban CPI inflation.

Independent Samples T-Test

		Statistic	p
All States	Mann-Whitney U	10344.5000	0.81453

Note. $H_a \mu_{Rural} \neq \mu_{Urban}$

Table 3: T-Test between Rural and Urban CPI

Source: *The jamovi project (2021)*

The researchers ran an independent samples T-test on CPI inflation data for the rural and urban categories. Since the data was not normally distributed, the Mann Whitney U-test was used instead of the Student’s T-test. With a p-value of 0.81453 (which is >0.05) the null hypothesis is accepted that the rural components of CPI are not equal to urban components of CPI.

Rural inflation has historically been higher than urban inflation in India. This is largely because of how inflation is calculated in rural and urban areas – in rural areas the food and beverage component has more than 50% weightage in the Consumer Price Index, whereas this component only has a 30-35% weightage in urban areas.



5.2 Effects of Inflation on Macroeconomic Indicators in India

Impact on Net National Income per Capita

We conducted a correlation test between change in net national income per capita and inflation to ascertain the relationship between adjusted net national income per capita and inflation. This was done to examine both the nature and extent of their interrelationship. From 1971 to 2021, data on the inflation rate and net national per capita income were gathered from the global bank website. For inflation and net national income per capita, a correlation test was run. At a 95% confidence level, a Pearson correlation test was conducted.

H₀: There is no statistically significant relationship between inflation rates and change in net national per capita income.

H₁: There is a statistically significant relationship between inflation rates and change in net national per capita income.

Correlation Matrix

		Inflation Rate (%)	Change in NNP (%)
Inflation Rate (%)	Pearson's r	—	
	df	—	
	p-value	—	
Change in NNP (%)	Pearson's r	-0.1266	—
	df	61	—
	p-value	0.32275	—

Table 4: Correlation between Inflation and Change in NNP per capita

Source: *The jamovi project (2021)*

The Pearson r statistic showed a negative correlation between the percentage change in Net National Income per Capita and inflation of -0.1266, although the p-value of 0.32275 (>0.05) indicates that the negative correlation is not statistically significant. As a result, it is determined that there is no significant association between the two variables, and the null hypothesis is adopted. This result is consistent with the presumption that changes in inflation do not always correspond to changes in national income. Hence, we accept null.

Impact on Unemployment

Historically, there has been a link between inflation and unemployment that is negative. When there is inflation, purchasing power is lost, which lowers demand and production and eventually results in decreased employment. The Phillips curve also refers to the trade-off between employment and inflation, namely that when unemployment is high, wages tend to fall, causing inflation. We have attempted to determine whether the relationship between inflation and unemployment has remained similar in the recent scenario of inflation in India that has risen over the RBI's suggested rates .

We attempted to ascertain the relationship between unemployment and inflation in the second analysis. The Pearson link between inflation and unemployment has been tested. This was carried out to



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determine whether the two factors had any kind of link. A Pearson correlation test was conducted At a 95% confidence level.

H₀: There is no statistically significant relationship between inflation rates and unemployment.

H₁: There is a statistically significant relationship between inflation rates and unemployment.

Correlation Matrix

		Unemployment Rate (%)	Inflation Rate (%)
Unemployment Rate (%)	Pearson's r	—	
	df	—	
	p-value	—	
Inflation Rate (%)	Pearson's r	-0.200	—
	df	30	—
	p-value	0.040	—

Table 5: Correlation between Inflation and Change in Unemployment

Source: The jamovi project (2021)

The Pearson r value for the relationship between unemployment and inflation was reported to be -0.20, and the p-value of 0.040 (<0.05) indicates that the relationship is statistically significant. As a result, we reach the conclusion that there is a strong negative correlation between the two variables. Hence, we accept null.

This result is consistent with past years because there has historically been a strong negative connection between the two variables, which supports the Phillips curve theory of inflation and unemployment.

This implies that the government must exercise extreme caution while implementing its fiscal and monetary policies since it is crucial to prevent stagflation in an expanding economy like India.

Impact on Stock Market Returns

H₀: There is no significant relationship between inflation and stock market returns.

H₁: There is a significant relationship between inflation and stock market returns.

Correlation Matrix

Correlation Matrix

		NIFTY annualised returns	Inflation rate
NIFTY annualised returns	Pearson's r	—	
	df	—	
	p-value	—	
Inflation rate	Pearson's r	0.0480	—
	df	21	—
	p-value	0.82796	—

Table 6: Correlation between CPI Inflation and Sensex Returns



Source: *The jamovi project (2021)*

To investigate the connection between stock market gains and CPI inflation, the researchers used Pearson's correlation test. It shows that NIFTY returns are positively correlated with the inflation rate but the test is not statistically significant as it has a p-value of 0.82796 (>0.05). Hence we accept null hypothesis.

This outcome contradicts the widely held idea that stock market returns decline during an era of rising interest rates. Except for brief spikes in volatility when a contractionary monetary policy is adopted, India's stock market has typically performed well amid periods of high inflation. In reality, several industries, such as the banking, pharmaceutical, and car industries, thrive in an inflationary environment.

5.3 Effects of Currency Depreciation on Macroeconomic Indicators in India

Impact on Net Exports

Currency depreciation has a significant impact on exports since it lowers the cost of exports while raising the price of imports, favoring the country's trade balance. It is helpful to know whether the rising exchange rate would have a positive influence on the economy in a country like India where a negative trade balance is a persistent issue and the currency has recently been declining.

H_0 : There is no significant relationship between the USD/INR exchange rate and net exports.

H_1 : There is a significant relationship between the USD/INR exchange rate and net exports.

Correlation Matrix

Correlation Matrix

		Exports (USD-Billion)	exchange rate
Exports (USD-Billion)	Pearson's r	—	
	df	—	
	p-value	—	
exchange rate	Pearson's r	0.8563	—
	df	18	—
	p-value	< .00001	—

Table 6: Correlation between Exchange Rate and Net Exports

Source: *The jamovi project (2021)*

There was a positive correlation reported between net exports (USD-Billion) and exchange rate with Pearson r's value coming out be 0.8563 and the p-value of <0.00001 (<0.05) which shows that the positive correlation is significant. Therefore, researchers arrive at the conclusion that both the variables do have a significant relationship. Thus we reject null hypothesis. It can be concluded that net exports have a statistically significant positive relationship with the exchange rate (USD/INR).

The correlation matches with the concept that net exports should rise with an increase in the exchange rate and this relationship has held strongly in India's case.

Impact on External Debt



A currency's depreciation often occurs due to a decrease in the availability of foreign exchange in an economy. If an economy does not experience favorable outcomes from a rising exchange rate, such as cheaper exports and a positive trade balance, it may face a shortage of foreign exchange. This can lead both governments and private organizations to acquire external debt to meet their foreign exchange needs. Therefore, it is crucial to assess whether an increasing exchange rate is exacerbating a situation of foreign exchange scarcity, potentially causing the country to assume higher levels of debt than are financially prudent. The researchers aim to investigate the connection between the USD/INR exchange rate and the levels of external debt in this context.

H_0 : There is no significant relationship between the USD/INR exchange rate and external debt.

H_1 : There is a significant relationship between the USD/INR exchange rate and external debt.

Correlation Matrix

Correlation Matrix

		External debt	Exchange rate
External debt	Pearson's r	—	
	df	—	
	p-value	—	
Exchange rate	Pearson's r	0.9417	—
	df	16	—
	p-value	<.00001	—

Table 7: Correlation between Quarterly Exchange Rate and External Debt

Source: *The jamovi project (2021)*

The researchers conducted a Pearson's correlation test to examine the relation between USD/INR exchange rates and external debt. With a p-value of less than 0.0001 (which is < 0.05), this indicates that there is a statistically significant, direct, and positive relationship between external debt and the USD/INR exchange rate. Hence we reject null hypothesis.

India's increasing external debt is primarily driven by persistent trade deficits, substantial borrowing for infrastructure development projects, and reliance on foreign capital inflows like FDI and FII. Short-term debt, exchange rate fluctuations, economic downturns, and government policy decisions also contribute to the debt burden. Non-sovereign entities, such as corporations and financial institutions, also play a role in accumulating external debt. The cost of external borrowing can be influenced by global interest rates. While external debt can be a tool for economic development, excessive and unsustainable levels of debt pose risks to India's economic stability, prompting policymakers to carefully manage and monitor the country's external debt situation.

7. Limitations

- The study is limited to data from India. The results of the study may not be generalizable to other countries with different economic conditions.



- The study uses a limited set of macroeconomic indicators. There are other macroeconomic factors that could also influence the relationship between inflation, currency depreciation, and macroeconomic performance.
- The study does not account for the impact of government policies. Government policies, such as monetary and fiscal policies, can also have a significant impact on inflation, currency depreciation, and macroeconomic performance.
- The study does not account for the impact of external factors. External factors, such as global economic conditions and geopolitical events, can also have a significant impact on inflation, currency depreciation, and macroeconomic performance.
- The study uses observational data. This means that we cannot draw causal conclusions from the results of the study. It is possible that there are other factors that are influencing the relationship between the variables of interest.
- The study uses a single econometric model. It is possible that the results of the study would be different if a different model was used.
- The sample size of the study is small. This means that the results of the study may be less reliable than the results of a study with a larger sample size.

8. Conclusion

This research paper delves into the multifaceted nature of inflation in India and its far-reaching effects on various macroeconomic indicators. Through a thorough examination of inflation data and its relationship with different economic parameters, we have gained valuable insights into the Indian economic landscape.

In India, inflation has been a persistent concern, with food inflation historically serving as a significant contributor to the overall inflation rate. However, our analysis reveals that the distinction between food and non-food inflation is dependent on the inflation index used. While the Wholesale Price Index (WPI) indicates a significant difference between food and non-food inflation, the Consumer Price Index (CPI) does not show the same level of distinction. Notably, the inclusion of fuel in the non-food component of CPI may contribute to this disparity. Additionally, rural and urban areas experience varying inflation rates, reflecting differences in consumption patterns.

Multiple macroeconomic indices have been negatively impacted by high inflation rates. It is noteworthy, though, that changes in the net national income have not always followed inflation. Using correlation analyses, we looked at how inflation affected several macroeconomic variables in India, focusing on its effects on Net National Income per Capita, Unemployment rates, and Stock Market Returns. The initial test results were consistent with previous trends, showing that there was no correlation between inflation and net national income that was significant, supporting the idea that the two variables did not demonstrate a strong association.

The findings from the second correlation test indicated a detrimental relationship between inflation and unemployment. These outcomes corroborated historical trends, which have consistently suggested that both variables exhibit a negative correlation. This alignment can be attributed to the fact that as inflation rises, purchasing power diminishes, subsequently reducing demand and production, ultimately resulting in employee layoffs. These results also support the Phillips Curve theory, which posits a connection between inflation and unemployment. According to this theory, when unemployment levels are less, wages tend to augment, contributing to a rise in inflation.

Inflation in general leads to an elevation in interest rates, making debt market instruments comparatively more appealing than equity investments (the stock market). In line with this observation, the correlation



test concluded that there is no substantial positive correlation between stock market returns and inflation. Nevertheless, this finding appears to contradict previous trends, where many sectors in India have thrived in an inflationary environment. This suggests that a controlled level of inflation can be conducive to an economy's well-being over the medium to long term.

Furthermore, we delved into the relation between net exports and the exchange rate of currency. In an ideal scenario, exports should experience growth as the exchange rate strengthens, and this very association was supported within the context of India. The Pearson's correlation test demonstrated a noteworthy and positive correlation between net exports and the currency exchange rate. India boasts various export-focused sectors, including information technology, pharmaceuticals, and textiles. These industries frequently enjoy advantages when the exchange rate becomes more competitive, which have been recognized to drive up export growth during periods of rupee depreciation.

Additionally, the Pearson correlation examination concerning external debt and the exchange rate established a meaningful and positive correlation. Historical patterns have also shown that when a nation's foreign exchange reserves decline, there is often a need to resort to external borrowing. While India's external debt exhibits a positive relationship with the exchange rate, it's worth noting that India's overall debt situation has been manageable. However, a noteworthy aspect is that over 50% of India's external debt is denominated in dollars, so as the Indian currency weakens, the cost of servicing India's debt obligations increases.

In conclusion, this research underscores the complexity of India's inflation dynamics and its wide-ranging impact on macroeconomic indicators. Policymakers should carefully consider these factors when formulating fiscal and monetary policies to ensure stable economic growth and to effectively manage risks associated with inflation and exchange rate fluctuations. The insights provided in this paper offer valuable guidance for policymakers and stakeholders in navigating the intricacies of India's economic landscape.

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10. Annexures

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