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Impact of Inflation on the Growth of Indian Economy

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Impact of Inflation on the Growth of Indian Economy

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I. Introduction

The central bank in the country is responsible for formulating and implementing the monetary policy to achieve sustainable economic growth and ensure price stability. An efficient way to maintain the price stability is to keep the inflation in a certain level by ensuring that it will hurt economic growth. Higher inflation can reduce the purchasing power and create instability in the economic system. Researchers has been trying to figure out the appropriate relationship between inflation and economic growth for many years. Some researchers concluded that there is negative relationship between inflation and gross domestic product (GDP) growth whereas several studies concluded that inflation is essential for economic growth. Determining a proper relationship is crucial for the policy makers to adjust both monetary and fiscal policy. High inflation discourages savings but saving is important for the economy as it converts to investment capital which fuel the economic growth. But it is not possible to achieve economic growth without having inflation as very low inflation discourages producers. Phillips first hypothesizes that higher inflation positively affects economic growth by lowering unemployment rates.

II. Inflation in India

Since independence, India's economy has faced several shocks from internal and external sources. These shocks affected almost all three manufacturing, service, and agriculture sectors to affect the economic growth. India has faced budget deficits, the deficit in the trade balance, higher inflation, and decreased industrial capacity for several years. But the long-term balance of payment, domestic savings, agricultural production, and government expenditure was growing. India has faced two digits inflations very few times, over the last decade, inflation was comparatively lower than the last decade which was a leading concern for the India's economic policymakers.

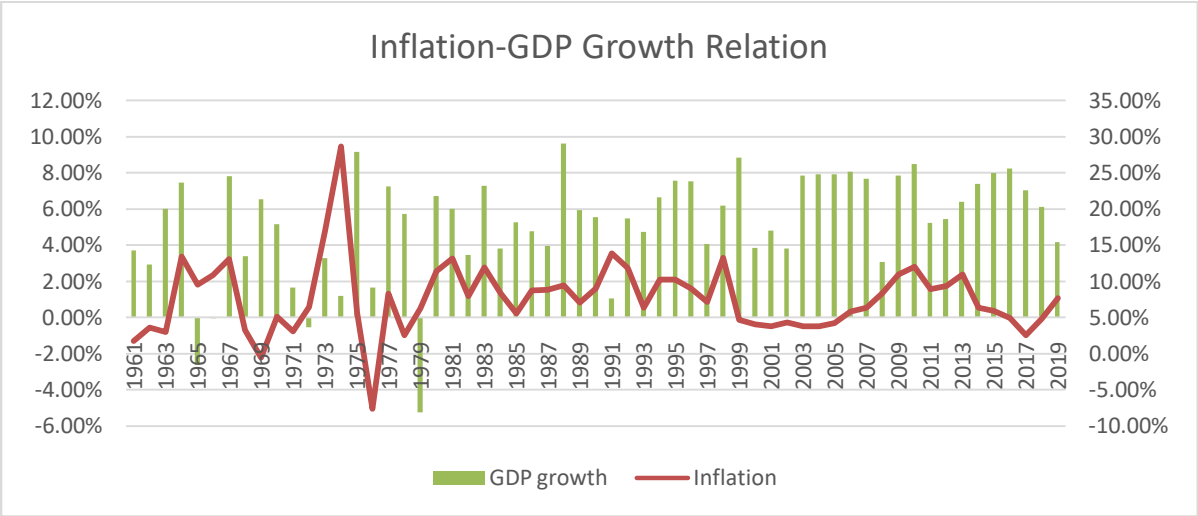

Figure 1

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III. Literature Review

Several studies have been conducted to identify the relationship between the inflation rate and economic growth. Although there is no concrete consensus among all the studies and studies are ongoing to solve the paradox.

In their growth model, Solow and Swan (1956) defined that technological innovation is the primary motivator in long-term growth, and it is determined exogenously, including inflation. In contrast, Mundel (1965) and Tobin (1965) predicted a positive relationship between inflation rate and capital growth required for economic growth. On the other hand, Sidrauski (1967) found an increase in inflation has no relation with capital stock neither output nor economic growth is affected.

Shitundu and Luvanda (2000) studied the effect of inflation on Tanzania's economic growth and found that inflation is detrimental to economic growth. Similarly, Mubarik (2005) found that low and stable inflation promotes economic growth in Tanzania. Attari & Javed (2013) carried out a study for Pakistan covering a period from 1980 to 2010. They concluded that there is a long-run relationship between the inflation rate and economic growth. However, there is no short-run relationship between the inflation rate and economic growth.

Hasanov (2010) investigated the relationship between the real GDP growth rate, Consumer Price Index Inflation, and the growth rate of real Gross Fixed Capital Formation from 2001-2009 in Azerbaijan and found a non-linear relationship between inflation and economic growth. It is similar to the findings of Eggoh & Khan (2014).

Umaru and Zubairu (2012) run the causality test and identified that GDP caused inflation and not inflation causing GDP in the Nigerian economy. The studies also conclude that there is a significant positive impact of inflation on economic growth and output. Similar results were found by Mallik and Chowdhury (2001) while studying Bangladesh, Pakistan, India, and Sri Lanka. They revealed that although moderate inflation promotes economic growth, faster economic growth absorbs inflation by overheating the economy.

Hussain & Zafar (2018) examined the association between money supply, inflation, government expenditure, and Pakistan's economic growth from 1972 to 2015. Using the Granger Causality tests, the researcher reveals that causality runs from Inflation to Economic Growth. Barro (2013) investigated inflation and economic growth for 100 countries used the data from 1960 to 1990. He identified that causation runs negatively from high persistent inflation to lower real GDP Growth.

Vinayagathasan (2013) discussed the impact of inflation on economic growth for 32 Asian economies from 1980 to 2009. The study concluded that maintaining 5.43% inflation does not hurt the economy, but above that rate, there is an inverse relationship between inflation rate and economic growth. Jha & Dang (2012) conducted similar studies in 31 developed and 182 developing countries using data from 1961 to 2009 and concluded that the threshold is 10% for developing countries. Ahamed (2021) studied the relationship between macroeconomic variables such as inflation, domestic credit, and banking sector liquidity for the period of 2005-2018. The study concludes that inflation has an inverse relation with liquidity, ultimately affecting the investment and output.

Manamperi (2014) studied the short term and long-term relationship between inflation and economic growth for BRICS (Brazil, Russia, India, China, South Africa) countries from 1980 to 2012 and observed that for India, there is a long-run positive association between inflation and economic growth and the negative short-run association was observed for Brazil, Russia, China, and South Africa.

IV. Data

The time-series data for the analysis has been collected from secondary sources for 59 years from the period 1961-2019. The data has been obtained from World Development Indicators (WDI), International Monetary Fund Database and Reserve Bank of India. The study period includes major reform, economic shift, regime changes, etc., to reflect the price volatility on economic growth.

V. Methodology

The preliminary statistical step is finding each data series stationarity through unit root tests in the time-series data. Non-stationary data contains unit roots, which can provide spurious correlation among the variables. The study used Augmented Dickey-Fuller Test (1979) and Phillips-Perron Unit Root Test (1988) to identify unit-roots existence. Phillips and Perron (1988) have generalized the Augmented Dickey-Fuller tests to the situations where the disturbance process in error term is serially correlated. The Phillips-Perron test is intended to add a 'Correction Factor' to the Augmented Dickey-Fuller test statistic.

The Vector Error Correction Model (VEC) was used to identify the short-run relationship between two cointegrated variables. The VEC Model analysis's focus is the one period lagged error terms from the previously estimated cointegrating equations. These lagged terms explain the short-run deviations from the long-run equilibrium. On the other hand, Vector Auto-regression (VAR) Model is used to identify the long-run dynamic relationship between model variables. In the end, the Granger causality test has been performed to identify the causal effects.

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VI. Results and Discussion

The Augmented Dickey-Fuller Test and Phillips-Perron Unit Root Test find that the variables are stationary and automatically cointegrated. So there exists a relationship between the independent and dependent variables. The p values for both variables in ADF and PP tests are less than the significance level of 5%. As a result, we reject the null hypothesis of non-stationarity.

Table 1: Augmented Dickey-Fuller Test

Variable	Dickey-Fuller	p-value
gdp	-6.9311	0.01
inf	-5.8938	0.01

Table 2: Phillips-Perron Unit Root Test

Variable	Dickey-Fuller Z(alpha)	p-value
gdp	-56.671	0.01
inf	-35.652	0.01

The Vector Error Correction Model and Vector Auto-regression Model identifies the short-run and long-run relationship between inflation and economic growth. In both models, lag 2 has been selected for better efficiency. The VECM identifies that the inflation rate is negatively associated with economic growth. But the error correction term is not significant, which concludes that the relationship between inflation with economic growth is volatile. However, lag 1 of GDP and lag 2 of GDP is exhibiting short term causality with inflation.

Table 3: Vector Error Correction Model

	ECT	Intercept	gdp -1	gdp -2	inf -1	inf -2
Equation gdp	-0.731(0.184)	4.8617(1.334)	-0.531(0.1731	-0.426(0.1777)	-0.184(0.1521)	-0.032(0.1336)
Equation inf	0.4318(0.12)	-2.755(0.877)	-0.631(0.1138)	-0.380(0.1169)	-0.208(0.1000)	-0.284(0.0879)

The VAR output confirms that the last year's inflation hurts GDP growth while economic growth positively affects. In the INF equation the GDP lag and inflation lag both very much significant. Considering the GDP equation both the inflation and GDP lag are insignificant. The model also concludes that last year's GDP growth negatively affect inflation whereas last year's inflation has positive impact. Last year's inflation and GDP both has positive impact on GDP growth, but both proved to be insignificant As growth positively affects current inflation in the long-run, there exists the possibility of long-run causality from growth to inflation. The covariance and correlation matrix also confirms the possible relationship between inflation and economic growth.

Table 4: Vector Auto-regression Model

Estimation results for equation gdp:

```
==========================
Estimate Std. Error t value Pr(>|t|)
inf.l1  0.03068   0.07910  0.388   0.700
gdp.l1  0.06073   0.13437  0.452   0.653
const   4.70182   1.02284  4.597 2.55e-05 ***
```

Estimation results for equation inf:

```
==========================
Estimate Std. Error t value Pr(>|t|)
inf.l1   0.3008    0.1178   2.554  0.01345 *
gdp.l1  -0.5749    0.2001  -2.873  0.00576 **
const    8.4406    1.5231   5.542 8.74e-07 ***
```

The granger causality test shows that inflation does not granger cause GDP growth. However, it also shows that GDP growth does granger cause inflation as well. Movements explain the economic growth's own shock in its own variance and the other variable.

Table 5: Granger Causality Test

```
Model 1: gdp ~ Lags(gdp, 1:2) + Lags(inf, 1:2)
Model 2: gdp ~ Lags(gdp, 1:2)
Res.Df Df      F Pr(>F)
1     52
2     54 -2 0.1046 0.9009
```

```
Model 1: inf ~ Lags(inf, 1:2) + Lags(gdp, 1:2)
Model 2: inf ~ Lags(inf, 1:2)
Res.Df Df    F  Pr(>F)
1     52
2     54 -2 4.29 0.01886
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VII. Impact of Covid-19

Covid-19 has an adverse impact in almost all the economies of the world. The government took steps to lockdown the country for about almost two months. Except for the emergency services, the government halted all the services and restricted social gathering. This shutdown of business has significant impact on the economic growth and daily lives. Huge number of people lost their jobs and migration from urban areas to rural areas became a common phenomenon.

VIII. Conclusion

The study focused on the relationship between inflation and the economic growth of Indian's economy from 1961-2019 period. The study concludes that inflation negatively affects the GDP in the short run but maybe a positive association in the long run. Although it is believed that some inflation is always good for the economy as it motivates the investors to invest and produce more output. However, inflation reduces the purchasing power and make the products more expensive for the consumers. So, an appropriate threshold level of inflation needs to be identified to support the policymaking. Keeping inflation levels below the threshold can achieve maximum growth for the economy.

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