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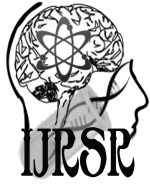
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Research Article

AN EMPIRICAL STUDY OF RELATION BETWEEN INFLATION AND ECONOMIC GROWTH IN INDIA

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ABSTRACT

The study attempts to empirically examine the relationship between WPI measure of inflation and economic growth in India, measured as gross domestic product (GDP) between the years 2000-01 and 2013-14. Relying on the trend analysis and Ordinary Least Squares (OLS) regression technique, the study examines the impact of GDP on wholesale price index (WPI). The result shows that coefficient of GDP is positive but statistically insignificant. The paper therefore recommends the need for expeditious implementation of the suggestions by Dr. Urijt Patel Committee and manage inflation in order to sustain economic growth.

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INTRODUCTION

Managing inflation is one of the key macro-economic challenges of the governments the world over. It is generally perceived to retard economic growth. In the case of India, it is more so because it is persistent, stubborn and highly unpredictable. Not to forget, the costs associated with inflation can impair the standard of living of a large proportion of the population in India who are defined as common and poor. This is because of multidimensional dynamics inflation possesses. According to Milton Friedman (1963)¹, inflation is always and everywhere a monetary phenomenon. It implies that monetary expansion causes inflation in the long run. Another opposite view is held by Swaminathan, S. Aiyar (2008)² in his article titled "India disproves Friedman on inflation" that supply of output plays a larger role in causing inflation and in countries like India where the monthly spend on food by households, be rural or urban, accounts for more than 40% on average and agriculture is rainfall and monsoon dependent, supply shocks emanating from food sector become relevant. Supply shocks are leading factors of inflation dynamics. Within overall price rise, food prices play an important role in the inflation process.

Statement of Problem

Inflation is a buzz word in every economy. It suggests a consistent rise in the general price level of goods and services over a period of time. In an economy, prices need to be stable in order to push savings, investment and growth. The prices also need to be stable to enable a reasonable standard of living.

In a developing economy, the association between growth, inflation, poverty ratio, capital accumulation and savings may be stronger at the predictably low and moderate levels of inflation than at high rate of inflation. During the first four decades of Country's planned economy that commenced from the year 1951, inflation rate was high and even volatile owing to a commonality of factors that includes agricultural output uncertainties. In the initial years of country's independence, though the focus of the economy was industrialization, the country's was challenged by constraints in finances. However, with the onset of the economic and financial sector reforms, the economy as well as the financial system has structurally transformed.

Among various economic factors, growth and employment are significant indicators of an economy. The choice is limited to growth for the purpose of the study. Several researches have subscribed to the view that inflation and growth are integrated. High inflation impacts growth, investment and rate of productivity growth. In extreme conditions, low inflation and small deficits may not be necessary for high growth. The economy inflation nexus remains a puzzle, more particularly after the global crisis year of 2008, when inflation was high and growth also was impressive.

In this dimension, the researcher has developed his research perspective and formulated broad research question as to whether WPI measure of inflation is related to economic growth, as measured by GDP and if so, to what extent?

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Objectives of Study

Research objectives are the statements of intent by the researcher in order to test the hypothesis. In this study, an attempt has been to explore the relationship between inflation and economic growth, in India, during the period 2001-2014. The other specific objectives are:

1. To evaluate the trend and measure of inflation within the Indian economy.
2. To study the impact of inflation over economic growth measured as GDP.

REVIEW OF LITERATURE

Stanley Fischer (1983)³ examined the role of economic factors in growth taking the data on various macroeconomic variables including inflation, concerning 93 countries. The finding of the study was that growth is negatively associated with inflation, large budget deficits and distorted foreign exchange markets. Inflation reduces growth by reducing investment and rate of productivity growth while budget deficits reduce both capital accumulation and productivity growth. The study concluded that inflation is one of the important economic factors that is related to growth and investment.

Robert J Barro (2013)⁴ studied the effects of inflation on economic performance by using the data for around 100 countries for a thirty year period from 1960. By employing statistical technique of regression equation, the results found that for an average annual increase of inflation by 10%, the growth rate of real GDP per capita reduces by 0.2% to 0.3% per year and that the ratio of investment to GDP falls by 0.4% to 0.6%. Inflation is an endogenous variables thus related to growth directly or indirectly. Inflation is caused by reduced growth and investment. Inflation causes a low real GDP per capita and investment. Inflation, growth and investment are co-integrated.

Prasanna V Salian and Gopakumar K (2011)⁵ Examine the existence of relationship between economic growth and inflation in India during the period 1972 -2007, by using the annual data. By using the Co-integration and Error Correction models, and the annual data, both the long run and short run dynamics of inflation and economic growth relationship in India have been tested. Their test results show that both are negatively related over long term and sensitivity of inflation to changes in growth rates is larger than that of growth to changes in inflation rates. The tests show that any increase in inflation from the previous period negatively affects growth. Price stability is an important factor for a sustainable economic growth. Adequate infrastructure is also necessary for economic growth.

Moltey (1994)⁶ examined the effect of inflation on real growth, using the data from a cross section of countries for a thirty year period and by extending the model developed by Mankiw, Romer and Well which was based on the Solow growth model. The results have found that there is a systematic tendency for higher inflation rates to be associated with slower real growth. Inflation has a negative effect on real growth that is economically and in many cases statistically significant. Real GDP economic growth and inflation are negatively correlated.

Elijah Udoh and Festus O Egwaikkhide (2008)⁷ examined the effect of exchange rate volatility and inflation uncertainty on foreign direct investment in Nigeria between the period 1970 and 2005, using GARCH model. The results conclude that exchange rate volatility and inflation uncertainty exert significant negative effect on foreign direct investment. Volatility in inflation rates and exchange rates increase uncertainty and risk element facing foreign investors and adversely affect the foreign investment in the Nigeria. The study has recommended that policy makers should pursue exchange rate and macro-economic stability in the interest of economic growth as a negative relationship between the two is always evident.

Khan And Senhadji (2001)⁸ examined the threshold effects on the relationship between inflation and economic growth, distinguishing industrialized and developing nations, by using the econometric techniques and the panel data for 140 countries covering the period from the year 1960 to 1998. The results strongly suggest the existence of a threshold level and it is 1% to 3% in the case of industrialized nations and 11% to 12% in the case of developing nations. Inflation below the threshold limit has no adverse effect on economic growth and if breached, would negatively affect the economic growth significantly. The relationship between inflation and growth is stronger at high frequencies.

Purnachandra Parida, Hrushikesh Mallick And Maathai K Mathiyazhagan (2001)⁹ examined the long-run dynamic relationship between fiscal deficits, money supply and price level in Indian context during the period 1960-61 to 1999-2000 by using Vector auto-regression (VAR) technique. The results observed that both fiscal deficits and money supply are influenced by each other and that price level does not influence either the fiscal deficit or the money supply but is being influenced by both the variables. Fiscal deficit has the tendency to cause higher inflation in India. Production of goods should improve in order to increase output and ensure price stability.

Lee Chin (2013)¹⁰ assesses the role of macro-economic fundamentals like economic growth, interest rate, money supply, exchange rate, price level, exports and imports etc. in the growth of Malaysia post the recession by performing the Granger- causality tests. The results show that price level and government spending Granger-caused economic growth in the short run while money supply and domestic interest rate are not effective in stimulating short run economic growth. On the other hand, monetary expansion leads to inflationary pressure in the short run. Fiscal policy has been an appropriate tool of adjustment in effecting economic growth in Malaysia during the post recessionary period. This shows that money supply and inflation are associated.

STUDY METHODOLOGY

Data description and selection

The study made use of the quarterly observations for the period of 14 years from April 2000 to March 2014. The data relates to WPI measure of inflation, also termed as headline inflation and GDP. GDP is the indicator of the health of the economy. Both the variables are sourced through official websites, Reserve Bank of India reports and bulletins etc. The data is also collected from World Bank website.

METHODOLOGY

The study examines the relationship between WPI measure of inflation and economic growth, measured as GDP. The methodology is based on the theoretical understanding of the trend of inflation and its impact on GDP. The econometric analysis employed in this study is consistent with the studies made by [Salian and Gopakumar \(2010\)](#) and others. According to [P K Naik and Padhi Puja \(2012\)¹¹](#), any new information about the fundamental economic factors such as growth, inflation, exchange rate, interest rate, fiscal deficit, employment etc. may influence the state of economy. As indicated by [Ahmed \(2008\)](#), the relationship between inflation and economic activity is much evident through its impact on stock market as stock market leads economic activity. The model is specified in the following functional equation.

$$GDP_t = f(WPI_t)$$

Where GDP reflects the economic growth and is the acronym of gross domestic product and WPI is the wholesale price index.

In order to examine the objectives of the study, firstly, the trend of inflation during the study period is analysed. However, a comparison of the trend is made in the graph by studying the trend for the entire post reforms era. The two periods of post reforms era namely pre-study period and study period are studied. Secondly, the impact of WPI measure of inflation on GDP is examined by applying regression technique. Regression technique predicts the explanation between the two.

RESULTS AND DISCUSSION

Trend Analysis¹²

A theoretical trend analysis of the post reforms era is made in this section. The study period started off, on the back of uncertainty regarding global recession and declining agricultural output. The year 2000-01 witnessed a WPI inflation rate of 7.2 per cent. The period between 2000-01 and 2004-05 witnessed volatility in terms of agricultural output due to vagaries of monsoon. The WPI inflation for the year 2004-05 rose owing to the hardening of the global oil prices. The year 2004-05 clearly demonstrated the influence of global factors on the domestic inflation in India. The five year headline inflation average for the period 2000-01 to 2004-05 was 5.24 per cent, much better than previous decadal average.

The period between 2005-06 and 2013-14 saw elevated headline inflation too often. Despite the drop in the year 2005-06 on account of Government and the fiscal intervention as well as the introduction of Value Added Tax (VAT) with effect April 2005, in most of the states in the country, the reduced inflation rate did not sustain. The year 2006-07 witnessed elevated headline inflation owing to the rise in international crude oil prices and price rise of primary articles such as wheat, pulses etc. The MSP in respect of cereals has gone up by more than 30 per cent during the year. The year 2007-08 registered decline in the overall WPI measure as well as in primary articles and manufactured products. Fuel and power group persistently showed a rise, though marginally. The year 2008-09 is considered as one of the extreme conditions period, with the domestic inflation caused by global effects. The price rise, in the case of oil, to an average of \$ 132.47 per barrel in

July 2008 along with price rise of minerals and metals related products, food items etc. accounted for high inflation during the year 2008-09. The economic crisis pushed up the Indian inflation from March 2008. The rate of inflation started decelerating from December 2008 and continued up to November 2009. Again, the inflation rate shot up and was persisting up to March 2014. The huge increase in fiscal deficit for the years 2008-09 and 2009-10 has one of the main drivers of inflation in the year 2008-09. Unfavourable agricultural supply conditions also fuelled the inflationary trend. In the year 2010-11, the overall WPI inflation has shot up to 9.6 per cent, the highest during the study period, largely due to food inflation. The years 2011:04 to 2014:03 showed signs of moderation in headline inflation, year on year basis, though high. The trend of WPI and CPI-IW inflation in the graph below indicates its persistence.

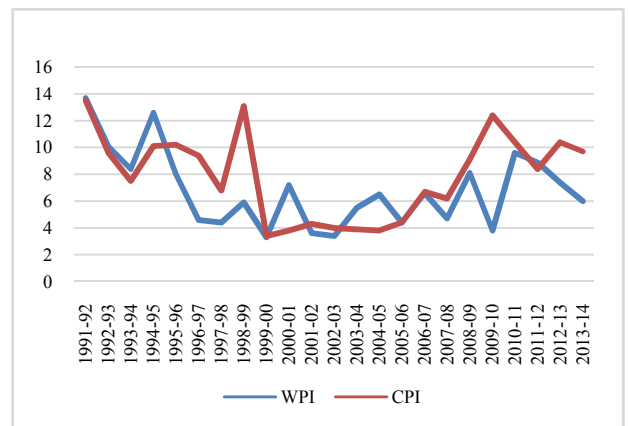


Fig Trend of inflation

Source: Author's compilation

Empirical investigation

The E views output of the regression analysis made is placed below. The results indicate that in the long run, GDP has positive coefficient but not statistically significant relationship. The findings of the study reveal that in the long run, change in economic growth leads to positive change in inflation during the study period, in India. This coincides with the study on the relationship between inflation and economic growth in Ethiopia by [Abis Getachew Makuria \(2013\)](#).

Table Regression output

Dependent Variable: LPWPI				
Method: Least Squares				
Date: 04/20/16 Time: 11:30				
Sample (adjusted): 3 56				
Included observations: 54 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.679075	0.081601	20.57672	0.0000
DDLGDPI	0.009859	0.966526	0.010201	0.9919
R-squared	0.000002	Mean dependent var		1.679095
Adjusted R-squared	-0.019229	S.D. dependent var		0.593789
S.E. of regression	0.599470	Akaike info criterion		1.850793
Sum squared resid	18.68696	Schwarz criterion		1.924459
Log likelihood	-47.97141	Hannan-Quinn criter.		1.879203
F-statistic	0.000104	Durbin-Watson stat		0.569444
Prob(F-statistic)	0.991900			

Source: Author's E Views output.

All the other parameters such as R squared, F – statistic, Prob-F statistic and Durbin- Watson statistic is not significant. They do

not reflect any relationship between the two. Durbin-Watson statistic indicates the presence of auto-correlation.

Suggestions

In the Indian context, the efforts to formalise the recommendations of Dr. Urjit Patel Committee should be expedited so that both the Government and RBI shall endeavour to keep the rate of inflation under check. A constant vigil by the monetary policy and fiscal policy setters and efficient regulation of macro-economic factors is needed in order to sustain and develop economic growth.

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